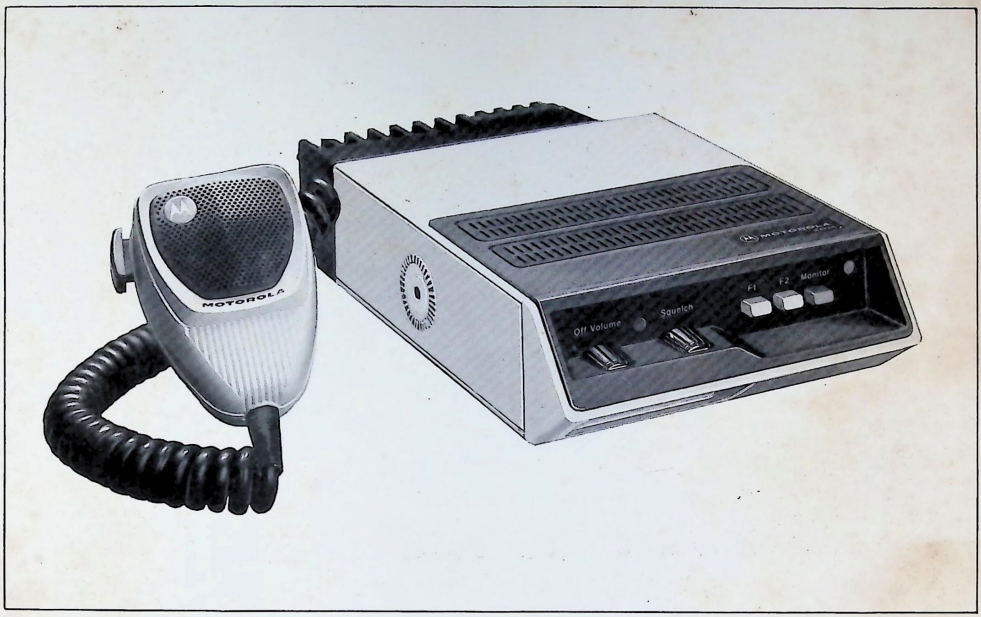
MOTOROLA

MAXAR™

Two-Way FM Radio

10 W/25 W RF Power
136-174 MHz



Instruction Manual

68P81025E70-K

COMMERCIAL WARRANTY
(STANDARD)

Motorola radio communications products are warranted to be free from defects in material and workmanship for a period of ONE (1) YEAR, (except for crystals and channel elements which are warranted for a period of ten (10) years) from the date of shipment. Parts, including crystals and channel elements, will be replaced free of charge for the full warranty period but the labor to replace defective parts will only be provided for One Hundred-Twenty (120) days from the date of shipment. Thereafter purchaser must pay for the labor involved in repairing the product or replacing the parts at the prevailing rates together with any transportation charges to or from the place where warranty service is provided. This express warranty is extended by Motorola Communications and Electronics, Inc., 1301 E. Algonquin Road, Schaumburg, Illinois 60196, to the original purchaser only, and only to those purchasing for purpose of leasing or solely for commercial, industrial, or governmental use.

THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED WHICH ARE SPECIFICALLY EXCLUDED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

In the event of a defect, malfunction or failure to conform to specifications established by seller, or if appropriate, to specifications accepted by Seller in writing, during the period shown, Motorola, at its option, will either repair or replace the product or refund the purchase price thereof, and such action on the part of Motorola shall be the full extent of Motorola's liability hereunder.

This warranty is void if:

a. the product is used in other than its normal and customary manner;
b. the product has been subject to misuse, accident, neglect or damage;
c. unauthorized alterations or repairs have been made, or unapproved parts used in the equipment.

This warranty extends only to individual products, batteries are excluded, but carry their own separate limited warranty. Because each radio system is unique, Motorola disclaims liability for range, coverage, or operation of the system as a whole under this warranty except by a separate written agreement signed by an officer of Motorola.

Non-Motorola manufactured products are excluded from this warranty, but subject to the warranty provided by their manufacturers, a copy of which will be supplied to you on specific written request.

In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

This warranty applies only within the United States.

EPS-27734-O

MOTOROLA

USER QUESTIONNAIRE

To the User of This Instruction Manual:

Motorola is engaged in a continuous program of improving its instruction literature. We believe that you can aid us in this program, so that we in turn can better help you service our equipment. To foster these aims, would you please answer the following questions:

SCHEMATIC DIAGRAMS AND CABLING DIAGRAMS

1. ☐ Are accurate and easy to follow
2. ☐ Contain minor errors
3. ☐ Contain major errors
4. ☐ Are difficult to follow

If you have checked any box except 1, please tell us what schematic diagrams, or portions thereof, were at fault, or enter other comments.*

_____

_____

TEXT

1. ☐ Easy to follow — helps to service equipment
2. ☐ Would like more information on*

_____

_____

3. ☐ Some instruction sections are too long or superfluous such as*

_____

_____

4. ☐ Other comments*

_____

_____

_____

(continued on reverse side)

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68P85901D80-L

7/12/79

PARTS LIST

1. ☐ Are complete and accurate
2. ☐ Would like more information as follows*

_____

_____

ILLUSTRATIONS IN GENERAL

1. ☐ Are complete and accurate
2. ☐ Want more illustrations such as*

_____

_____

3. ☐ Some are superfluous such as*

Second Fold

_____

_____

Second Fold

The name of my instruction manual is:

_____

Tear out page at dotted line

The part number of my instruction manual is:

_____

(This number will be found on the cover or on the title page)

My name is _____

Company _____

Address _____

City _____ State _____ Zip _____

Date _____

Phone No. (include area code) _____

*Whenever possible, give complete model number of equipment, and part number of diagram or part number of instruction section. **This information is important.**

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Schaumburg, Illinois 60196

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MOTOROLA INC.
Communications Group

MAXAR
TWO-WAY FM RADIO
10 W/25 W RF POWER
136-174 MHz

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Test Equipment, Metering and Adapter Cables PEPS-30243
Transmitter Alignment PEPS-17225
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TPN1136A BASE STATION POWER SUPPLY SCHEMATIC DIAGRAMS, CIRCUIT BOARD DETAIL, PARTS LIST AND POWER CABLES, MODELS TKN6948A AND TKN6949A 68P81029E96

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68P81025E70-K
2/1/81-PHI

SECTION *NUMBER*

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DESK MICROPHONE SCHEMATIC DIAGRAM, CIRCUIT BOARD DETAIL AND PARTS LIST 68P81044E77

TRN6207A "DIGITAL PRIVATE-LINE" ENCODER/DECODER SCHEMATIC DIAGRAM, CIRCUIT BOARD DETAIL AND PARTS LIST 68P81030E07

SPECIFICATIONS FOR *MAXAR* VHF 10 W/25 W

GENERAL

Maximum Battery Drain at 13.8 V	Transmit	Receive	Standby (Squelched)
10-Watt Models	3A	1.0A	0.3A
25-Watt Models	6A	1.0A	0.3A
Frequency Range	136-174 MHz		
Dimensions	2-1/4" H x 6-1/2" W x 8-1/2" D (57 mm x 165 mm x 212 mm)		
Weight	10-Watt: 3.0 lbs. 25-Watt: 3.8 lbs.		

TRANSMITTER

RF Power Output	10 Watts	25-Watts
Spurious & Harmonic Emissions*	56 dB below carrier	60 dB below carrier
Output Impedance	50 ohms	
Frequency Stability	±0.0005%; -30°C to + 60°C (+25°C reference)	
Modulation	16F3	
Audio Sensitivity	160 mV ±3 dB for 3.0 kHz deviation at 1000 Hz	
FM Hum & Noise	-70 dB below ±3.0 kHz deviation at 1000 Hz (-55 dB for base station models)	
Audio Response	+1, -3 dB of 6 dB/octave pre-emphasis (300 to 3000 Hz)	
Audio Distortion	Less than 3%	

* Per EIA specification RS-152B, paragraph 4.

RECEIVER

Channel Spacing	30 kHz
Selectivity — EIA SINAD	-70 dB at ±30 kHz
Intermodulation — EIA SINAD	-70 dB
EIA Modulation Acceptance	±7 kHz
Sensitivity	0.35 uV or less for 20 dB quieting 0.3 uV or less for 12 dB SINAD
Frequency Stability	±0.0005%; -30°C to +60°C (+25°C reference)
Spurious & Image Rejection	Greater than 70 dB
Squelch Threshold Sensitivity	Less than 0.2 uV
Audio Output	3 watts, with less than 10% distortion
Audio Response	+2, -8 dB/octave de-emphasis from 300 to 3000 Hz)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

FCC Transmitter License Designations

RF Output	Single-Frequency	Two-Frequency
10-Watts	CC3268	CC3269
25-Watts	CC3270	CC3271

FCC Receiver Certification Numbers

Receiver Type	Number
Single-Frequency	RC0103
Two-Frequency	RC0104

FOREWORD

1. SCOPE OF MANUAL

This manual is intended for use by experienced technicians familiar with similar types of equipment. It contains all service information required for the equipment described and is current as of the printing date. Changes which occur after the printing date are incorporated by Instruction Manual Revisions (SMR). These SMR's are added to the manuals as the engineering changes are incorporated into the equipment.

2. MODEL AND KIT IDENTIFICATION

Motorola equipments are specifically identified by an overall model number on the nameplate. In most cases, assemblies and kits which make up the equipment also have kit model numbers stamped on them. When a production or engineering change is incorporated, the applicable schematic diagrams are updated.

As diagrams are updated, information about the change is incorporated into a revision column. This revision column appears in the manual next to the parts list or, in some cases, on the diagram. It lists the reference number, part number, and description of the parts removed or replaced.

3. SERVICE

Motorola's National Service Organization offers one of the finest nation-wide installation and maintenance programs available to communication equipment users. This organization includes approximately 900 authorized Motorola Service Stations (MSS) located throughout the United States, each manned by one or more trained, FCC licensed technicians.

These MSS's are independently owned and operated and were selected by Motorola to service its customers. Motorola maintenance is available on either a time and material basis or on a periodic fixed-fee type arrangement.

The administrative staff of this organization consists of national, area and district service managers and district representatives, all of whom are Motorola employees with the objective to improve the service to our customers.

Should you wish to purchase a service contract for your Motorola equipment, contact your Motorola Service Representative, or write to:

National Service Manager
Motorola Communications and Electronics, Inc.
1303 E. Algonquin Road
Schaumburg, Illinois 60196

4. REPLACEMENT PARTS ORDERING

Motorola maintains a number of parts offices strategically-located throughout the United States. These facilities are staffed to process parts orders, identify part numbers, and otherwise assist in the maintenance and repair of Motorola Communications Group products.

Orders for all parts *except* crystals, active filters, code plugs, channel elements, and "Vibrasender" ® and "Vibrasponder" ® resonant reeds should be sent to the nearest area parts center. Orders for instruction manuals should also be sent to the area parts center.

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known, the order should include the number of the chassis or kit of which it is a part, and sufficient description of the desired component to identify it.

Orders for crystals, channel elements, active filters, code plugs, and reeds should be sent directly to the factory address listed on the following page. Crystal and channel element orders should specify the crystal or channel element type number, crystal and carrier frequency, and the chassis model number in which the part is used.

Orders for active filters, code plugs, "Vibrasender" and "Vibrasponder" resonant reeds should specify type number and frequency, and should identify the owner/operator of the communications system in which these items are to be used.

5. ADDRESSES

5.1 GENERAL OFFICES

MOTOROLA Communications and Electronics Inc.
Communications Group Parts Dept.
1313 E. Algonquin Rd.,
Schaumburg, Illinois 60196
Phone: 312-576-3900

5.2 U.S. ORDERS

WESTERN AREA PARTS
1170 Chess Drive, Foster City,
San Mateo, California 94404
Phone: 415-349-3111
TWX: 910-375-3877

MIDWEST AREA PARTS
1313 E. Algonquin Road
Schaumburg, Ill. 60196
Phone: 312-576-7322
TWX: 910-693-0869

MID-ATLANTIC AREA PARTS
7230 Parkway Drive
Hanover, Maryland 20176
Phone: 301-796-8600
TWX: 710-862-1941

EAST CENTRAL AREA PARTS
12995 Snow Road,
Parma, Ohio 44130
Phone: 216-267-2210
TWX: 810-421-8845

EASTERN AREA PARTS
85 Harristown Road,
Glen Rock, New Jersey 07452
Phone: 201-447-4000
TWX: 710-988-5602

PACIFIC SOUTHWESTERN AREA PARTS
P.O. Box 85036
San Diego, California 92138
Phone: 714-578-2222
TWX: 910-335-1634

GULF STATES AREA PARTS
8550 Katy Freeway
Suite 128
Houston, Texas 77024
Phone: 713-932-8955

SOUTHWESTERN AREA PARTS
P.O. Box 34290
3320 Belt Line Road,
Dallas, Texas 75234
Phone: 214-241-2151
TWX: 910-860-5505

SOUTHEASTERN AREA PARTS
P.O. Box 368
Decatur, Georgia 30031
Phone: 504-981-9800
TWX: 810-766-0876

5.3 CANADIAN ORDERS

CANADIAN MOTOROLA ELECTRONICS COMPANY
National Parts Department
3125 Steeles Avenue,
East Willowdale, Ontario
Phone: 416-499-1441
TWX: 610-492-2713
Telex: 02-29944LD

5.4 ALL COUNTRIES EXCEPT U.S. AND CANADA

MOTOROLA, INC. OR MOTOROLA AMERICAS, INC.
International Parts Dept.
1313 E. Algonquin Road
Schaumburg, Illinois 60196 U.S.A.
Phone: 312-576-6492
TWX: 910-693-0869
Telex: 722443 or 722424
Cable: MOTOL PARTS

5.5 FACTORY ADDRESS FOR CRYSTAL, CHANNEL ELEMENT, ACTIVE FILTER, CODE PLUGS AND RESONANT REED ORDERS

ALL MAIL ORDERS
Motorola, Inc.
Component Products Sales & Service
P.O. Box 66191
O'Hare International Airport
Chicago, Ill. 60666

CORRESPONDENCE
Motorola, Inc.
Component Products Sales & Service
2553 N. Edgington Street
Franklin Park, Illinois 60131

CURRENT VERSION

MODEL CHART

FOR

MAXAR

FM TWO-WAY RADIO

136-174 MHz

10 W & 25 W RF POWER

+ 12 V MOBILE

CODE:

- ● = ONE ITEM SUPPLIED WITH EACH RADIO.
- / = ONE ITEM SUPPLIED WITH EACH RADIO DEPENDENT UPON FREQUENCY.
- **2** = NUMBER INDICATES QUANTITY SUPPLIED WITH EACH RADIO, DEPENDENT UPON FREQUENCY.
- * = REFER TO UNIFIED CHASSIS MODEL CHART FOR LOWER LEVEL KITS.

MODEL NUMBER	NUMBER OF OPERATING FREQUENCIES	SQUELCH	RF POWER
MOBILE MODELS			
D23TRA1000BK	1	CARRIER	10 W
D23TRA1300BK	2	CARRIER	10 W
D23TRA3000BK	1	*PRIVATE-LINE*	10 W
D23TRA3300BK	2	*PRIVATE-LINE*	10 W
D23TRA6000BK	1	DIGITAL PRIVATE-LINE	10 W
D23TRA6300BK	2	DIGITAL PRIVATE-LINE	10 W
D33TRA10000BK	1	CARRIER	25 W
D33TRA13000BK	2	CARRIER	25 W
D33TRA3000BK	1	*PRIVATE-LINE*	25 W
D33TRA3300BK	2	*PRIVATE-LINE*	25 W
D33TRA6000BK	1	DIGITAL PRIVATE-LINE	25 W
D33TRA6300BK	2	DIGITAL PRIVATE-LINE	25 W

MODEL NUMBER	DESCRIPTION
*TUD1891AB	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 10 W
*TUD1892AB	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 10 W
*TUD1893AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 10 W
*TUD1901AH	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 10 W
*TUD1902AH	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 10 W
*TUD1903AH	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 10 W
*TUD1912AB	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 25 W
*TUD1913AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 25 W
*TUD1921AH	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 25 W
*TUD1922AH	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 25 W
*TUD1923AH	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 25 W
TRN6207A	*DIGITAL PRIVATE-LINE* ENCODER/DECODER BOARD
TRN6005A	CODE PLUG
TRN6177C	*PRIVATE-LINE* ENCODER/DECODER BOARD
KLN6209A	*VIBRASPONDER* RESONANT REED
THN6244A	HOUSING
TRN6204A	HARDWARE; 1-FREQ., *PRIVATE-LINE* SQUELCH
TRN6206A	HARDWARE; 2-FREQ., CARRIER SQUELCH
TRN6205A	HARDWARE; 2-FREQ., *PRIVATE-LINE* SQUELCH
TRN6211A	ESCUTCHEON; 1-FREQ., CARRIER SQUELCH
TRN6212A	ESCUTCHEON; 2-FREQ., CARRIER SQUELCH
TRN6213A	ESCUTCHEON; 1-FREQ., *PRIVATE-LINE* SQUELCH
TRN6214A	ESCUTCHEON; 2-FREQ., *PRIVATE-LINE* SQUELCH
TKN6794A	POWER CABLE
TLN5992A	INSTALLATION KIT
TAD6111A	ANTENNA (136-144 MHz)
TAD6112A	ANTENNA (144-152 MHz)
TAD6113A	ANTENNA (152-162 MHz)
TAD6114A	ANTENNA (162-174 MHz)
KXN6121AA	CRYSTAL, XMTR
KXN6122AA	CRYSTAL, RCVR
KXN6121AG	CRYSTAL, XMTR
KXN6122AH	CRYSTAL, RCVR (136-150.8 MHz ONLY)
TMN6104B	MICROPHONE
TLN4839A	MICROPHONE HANG-UP KIT
TRN6283A	MICROPHONE HANG-UP KIT (*PRIVATE-LINE* MODELS ONLY)

EPS-31271-O

CURRENT VERSION

UNIFIED CHASSIS KITS

FOR

MAXAR

FM TWO-WAY RADIO

136-174 MHz

10 W & 25 W RF POWER

+ 12 V MOBILE

CODE:

● = ONE ITEM SUPPLIED

MODEL NUMBER	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 10-WATT	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 10-WATT	UNIFIED CHASSIS (162-174 MH); 1-FREQ., 10-WATT	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 10-WATT	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 10-WATT	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 10-WATT	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 25-WATT	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 25-WATT	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 25-WATT
TUD1891AB	●											
TUD1892AB		●										
TUD1893AB			●									
TUD1901AH	●											
TUD1902AH		●										
TUD1903AH			●									
TUD1912AB				●								
TUD1913AB					●							
TUD1921AH						●						
TUD1922AH							●					
TUD1923AH								●				
	●			●			●			●		
		●	●		●	●		●	●		●	●
	●						●			●		
							●	●	●	●	●	●
	●			●								

MODEL NUMBER	DESCRIPTION
TLD5401A	MAIN BOARD (136-150.8 MHz); 1-FREQ., 10-WATT
TLD5402A	MAIN BOARD (150.8-162 MHz); 1-FREQ., 10-WATT
TLD5403A	MAIN BOARD (162-174 MHz); 1-FREQ., 10-WATT
TLD5411A	MAIN BOARD (136-150.8 MHz); 2-FREQ., 10-WATT
TLD5412A	MAIN BOARD (150.8-162 MHz); 2-FREQ., 10-WATT
TLD5413A	MAIN BOARD (162-174 MHz); 2-FREQ., 10-WATT
TLD5422A	MAIN BOARD (150.8-162 MHz); 1-FREQ., 25-WATT
TLD5423A	MAIN BOARD (162-174 MHz); 1-FREQ., 25-WATT
TLD5431A	MAIN BOARD (136-150.8 MHz); 2-FREQ., 25-WATT
TLD5432A	MAIN BOARD (150.8-162 MHz); 2-FREQ., 25-WATT
TLD5433A	MAIN BOARD (162-174 MHz); 2-FREQ., 25-WATT
TLD2041A	25-WATT POWER AMPLIFIER (136-150.8 MHz)
TLD2042A	25-WATT POWER AMPLIFIER (150.8-162 MHz)
TLD2043A	25-WATT POWER AMPLIFIER (162-174 MHz)
TRN6177C	PL ENCODER/DECODER BOARD
TRN6203A	HARDWARE, MAIN BOARD; 10-WATT
TRN6204A	HARDWARE, 1-FREQ., *PRIVATE-LINE*
TRN6221A	HARDWARE, MAIN BOARD; 25-WATT
TRN8002A	HARDWARE, MAIN BOARD; 10-WATT (136-150.8 MHz)

EPS-31272-O

MOTOROLA

EARLIER VERSION

UNIFIED CHASSIS KITS

FOR

"MAXAR"

FM TWO-WAY RADIO

136-174 MHz
10 W & 25 W RF POWER

+12 V MOBILE

117 V AC BASE STATION

CODE:

☒ = ONE ITEM SUPPLIED

* = REFER TO SAME MODEL NUMBER IN UNIFIED CHASSIS LISTING FOR LOWER LEVEL KITS.

MODEL NUMBER	DESCRIPTION	TUD1891AB	TUD1892AB	TUD1893AB	TUD1901AH	TUD1902AH	TUD1903AH	TUD1911AB	TUD1912AB	TUD1913AB	TUD1921AH	TUD1922AH	TUD1923AH	TUD1981AB	TUD1982AB	TUD1983AB	TUD2001AB	TUD2002AB	TUD2003AB
	DESCRIPTION	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 10-WATT	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 10-WATT	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 10-WATT	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 10-WATT	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 10-WATT	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 10-WATT	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 25-WATT	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 25-WATT	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 25-WATT	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 25-WATT	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 10-WATT	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 10-WATT	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 10-WATT
TLD5401A	MAIN BOARD (136-150.8 MHz); 1-FREQ., 10-WATT	☒																	
TLD5402A	MAIN BOARD (150.8-162 MHz); 1-FREQ., 10-WATT		☒																
TLD5403A	MAIN BOARD (162-174 MHz); 1-FREQ., 10-WATT			☒															
TLD5411A	MAIN BOARD (136-150.8 MHz); 2-FREQ., 10-WATT				☒														
TLD5412A	MAIN BOARD (150.8-162 MHz); 2-FREQ., 10-WATT					☒													
TLD5413A	MAIN BOARD (162-174 MHz); 2-FREQ., 10-WATT						☒												
TLD5421A	MAIN BOARD (136-150.8 MHz); 1-FREQ., 25-WATT							☒											
TLD5422A	MAIN BOARD (150.8-162 MHz); 1-FREQ., 25-WATT								☒										
TLD5423A	MAIN BOARD (162-174 MHz); 1-FREQ., 25-WATT									☒									
TLD5431A	MAIN BOARD (136-150,8 MHz); 2-FREQ., 25-WATT										☒								
TLD5432A	MAIN BOARD (150,8-162 MHz); 2-FREQ., 25-WATT											☒							
TLD5433A	MAIN BOARD (162-174 MHz); 2-FREQ., 25-WATT												☒						
TLD2041A	25-WATT POWER AMPLIFIER (136-150.8 MHz)							☒			☒			☒					
TLD2042A	25-WATT POWER AMPLIFIER (150.8-162 MHz)								☒			☒			☒				
TLD2043A	25-WATT POWER AMPLIFIER (162-174 MHz)									☒			☒			☒			
TRN6177B	"PL" ENCODER/DECODER BOARD													☒	☒	☒	☒	☒	☒
TRN6203A	HARDWARE, MAIN BOARD; 10-WATT	☒	☒		☒	☒													
TRN6204A	HARDWARE, FOR 1-FREQ., "PRIVATE-LINE"													☒	☒	☒	☒	☒	☒
TRN6221A	HARDWARE: MAIN BOARD; 25-WATT							☒	☒	☒	☒	☒	☒						
*TUD1891AB	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 10-WATT																☒		
*TUD1892AB	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 10-WATT																	☒	
*TUD1893AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 10-WATT																		☒
*TUD1911AB	UNIFIED CHASSIS (136-150,8 MHz); 1-FREQ., 25-WATT													☒					
*TUD1912AB	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 25-WATT														☒				
*TUD1913AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 25-WATT															☒			
TRN8002A	HARDWARE, MAIN BOARD; 10-Watt (136-150,8 MHz)	☒		☒															

EPS-21069-C

MOTOROLA

EARLIER VERSION

MODEL CHART

FOR

"MAXAR"

FM TWO-WAY RADIO

136-174 MHz

10 W & 25 W RF POWER

+12 V MOBILE

117 V AC BASE STATION

CODE:

- ☒ = ONE ITEM SUPPLIED WITH EACH RADIO
- ⧄ = ONE ITEM SUPPLIED WITH EACH RADIO DEPENDENT UPON FREQUENCY
- [0] = ONE ITEM SUPPLIED FOR 10 OR LESS RADIO SETS
- [2] = NUMBER INDICATES QUANTITY SUPPLIED WITH EACH RADIO, DEPENDENT UPON FREQUENCY
- [•] = REFER TO UNIFIED CHASSIS MODEL CHART FOR LOWER LEVEL KITS

NOTE:
1. FOR PAGING CENTRAL STATIONS REFER TO SUPPLEMENT 68P81033E80.

MODEL NUMBER	DESCRIPTION	D21TRA1000AK	D23TRA1300AK	D23TRA3000AK	D23TRA3300AK	D23TRA6000AK	D23TRA6300AK	D33TRA1000AK	D33TRA1300AK	D33TRA3000AK	D33TRA3300AK	D33TRA6000AK	D33TRA6300AK	L33TRD1100AM	L33TRD1130AM	L33TRD3100AM	L33TRD3130AM	L33TRD6100AM	L43TRD6130AM	L33TRA1105DM	L33TRD3105DM	L43TRD6105DM	L43TRD1135DM	L33TRD3135DM	L43TRD6135DM
	RF POWER	10 W	10 W	10 W	10 W	10 W	25 W	25 W	25 W	25 W	25 W	25 W	25 W	10 W	10 W	10 W	10 W	10 W	25 W	25 W	25 W	25 W	25 W	25 W	25 W
	SQUELCH	MOBILE MODELS																		PAGE CENTRAL MODELS (NOTE 1)					
		CARRIER	CARRIER	"PRIVATE-LINE"	"PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"	CARRIER	CARRIER	"PRIVATE-LINE"	"PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"	CARRIER	CARRIER	"PRIVATE-LINE"	"PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"	CARRIER	"PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"	CARRIER	"PRIVATE-LINE"	"DIGITAL PRIVATE-LINE"
	NUMBER OF OPERATING FREQUENCIES	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	1	1	2	2	2
▫TUD1891AB	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 10-WATT	☒		☒		☒		☒		☒		☒		☒		☒		☒		☒					
▫TUD1892AB	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 10-WATT	☒		☒		☒		☒		☒		☒		☒		☒		☒			☒				
▫TUD1893AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 10-WATT	☒		☒		☒		☒		☒		☒		☒		☒		☒				☒			
▫TUD1901AH	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 10-WATT		☒		☒		☒		☒		☒		☒		☒		☒		☒	☒					
▫TUD1902AH	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 10-WATT		☒		☒		☒		☒		☒		☒		☒		☒		☒		☒				
▫TUD1903AH	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 10-WATT		☒		☒		☒		☒		☒		☒		☒		☒		☒			☒			
▫TUD1911AB	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 25-WATT	☒		☒		☒		☒		☒		☒		☒		☒		☒		☒					
▫TUD1912AB	UNIFIED CHASSIS (150,8-162 MHz); 1-FREQ., 25-WATT	☒		☒		☒		☒		☒		☒		☒		☒		☒			☒				
▫TUD1913AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 25-WATT	☒		☒		☒		☒		☒		☒		☒		☒		☒				☒			
▫TUD1921AH	UNIFIED CHASSIS (136-150.8 MHz); 2-FREQ., 25-WATT		☒		☒		☒		☒		☒		☒		☒		☒		☒	☒					
▫TUD1922AH	UNIFIED CHASSIS (150.8-162 MHz); 2-FREQ., 25-WATT		☒		☒		☒		☒		☒		☒		☒		☒		☒		☒				
▫TUD1923AH	UNIFIED CHASSIS (162-174 MHz); 2-FREQ., 25-WATT		☒		☒		☒		☒		☒		☒		☒		☒		☒			☒			
▫TUD1981AB	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 25-WATT		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄	⧄					
▫TUD1982AB	UNIFIED CHASSIS (150.8-162 MHz); 1-FREQ., 25-WATT		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄				
▫TUD1983AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 25-WATT		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄			⧄			
▫TUD2001AB	UNIFIED CHASSIS (136-150.8 MHz); 1-FREQ., 10-WATT		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄	⧄					
▫TUD2002AB	UNIFIED CHASSIS (150,8-162 MHz); 1-FREQ., 10-WATT		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄				
▫TUD2003AB	UNIFIED CHASSIS (162-174 MHz); 1-FREQ., 10-WATT		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄		⧄			⧄			
TRN6207A	DIGITAL "PRIVATE-LINE" ENCODER/DECODER BOARD					☒	☒					☒	☒					☒	☒	☒	☒	☒	☒	☒	☒
TRN6005A	CODE PLUG					⧄	⧄					⧄	⧄					⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄
TRN6177B/C	"PL" ENCODER/DECODER BOARD		☒		☒				☒		☒				☒		☒		☒				☒	☒	☒
TLN6709B	"VIBRASPONDER" RESONANT REED	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
THN6244A	HOUSING	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
TRN6204A	HARDWARE FOR 1-FREQ., "PRIVATE-LINE"			☒	☒					☒	☒					☒	☒						☒	☒	
TRN6206A	HARDWARE FOR 2-FREQ., CARRIER SQUELCH		☒				☒		☒				☒		☒				☒						
TRN6205A	HARDWARE FOR 2-FREQ., "PRIVATE-LINE"				☒						☒						☒							☒	
TRN6211A	ESCUTCHEON FOR 1-FREQ., CARRIER-SQUELCH	☒				☒		☒				☒		☒				☒		☒					
TRN6212A	ESCUTCHEON FOR 2-FREQ., CARRIER SQUELCH		☒				☒		☒				☒		☒				☒						
TRN6213A	ESCUTCHEON FOR 1-FREQ., "PRIVATE-LINE"			☒						☒						☒							☒		
TRN6214A	ESCUTCHEON FOR 2-FREQ., "PRIVATE-LINE"				☒						☒						☒							☒	
TRN6215A	ESCUTCHEON FOR 1-FREQ., DIGITAL "PRIVATE-LINE"					☒						☒						☒		☒					
TRN6216A	ESCUTCHEON FOR 2-FREQ., DIGITAL "PRIVATE-LINE"						☒						☒						☒						
TPN1136A	AC POWER SUPPLY													☒	☒	☒	☒	☒	☒						
TRN6223A	BASE TRAY													☒	☒	☒	☒	☒	☒						
TKN6842A	CABLE, INTERFACE PAGING BASE																			☒	☒	☒	☒	☒	☒
TKN6794A	POWER CABLE (25 W MODELS)																			☒	☒	☒	☒	☒	☒
TRN6209A	INSTALLATION KIT	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒												
TAD6112A	ANTENNA (144-152 MHz)	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄												
TAD6113A	ANTENNA (152-162 MHz)	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄												
TAD6114A	ANTENNA (162-174 MHz)	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄	⧄												
KXN6121AA	CRYSTAL, XMTR	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]
KXN6122AA	CRYSTAL, RCVR	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]
TKN6948A	POWER CABLE																			☒	☒	☒	☒	☒	☒
TMN6104A	MICROPHONE	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒												
TLN4839A	MICROPHONE HANG-UP KIT	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒												
TRN6283A	"PL" MICROPHONE HANG-UP KIT		☒		☒		☒		☒		☒		☒		☒		☒		☒				☒	☒	☒
TMN1008A	"PL" DESK MICROPHONE														☒		☒		☒						
TMN1009A	CARRIER SQUELCH DESK MICROPHONE																			☒	☒	☒	☒	☒	☒
TMN1018A	"PL" DESK MICROPHONE (PAGING)																			☒	☒	☒	☒	☒	☒

EPS-17372-H

MAXAR High Band
Radio Set Internal Options Table

Option Number	Kit Number	Description	Reference Publication
B96AA	TRN6320A	Inverted Escutcheon, 1-Freq. Carrier Squelch	Note 1
B96AB	TRN6321A	Inverted Escutcheon, 2-Freq. Carrier Squelch	Note 1
B96AC	TRN6322A	Inverted Escutcheon, 1-Freq. PL or DPL Squelch	Note 1
B96AD	TRN6323A	Inverted Escutcheon, 2-Freq. PL or DPL Squelch	Note 1
B561	Note 2	*Quik-Call II* Signaling; Individual, Carrier Squelch	68P81038E25
B562	Note 2	*Quik-Call II* Signaling; Individual, Carrier Squelch, Horn & Light	68P81038E25
B563	Note 2	*Quik-Call II* Signaling; Group, Carrier Squelch, Horn & Light	68P81038E25
B162	Note 2	*Quik-Call II* Signaling; Individual, PL and DPL Squelch	68P81038E15
B163	Note 2	*Quik-Call II* Signaling; Individual, PL and DPL Squelch, Horn & Light	68P81038E15
B164	Note 2	*Quik-Call II* Signaling; Group, PL and DPL Squelch, Horn & Light	68P81038E15
B165	Note 2	*Quik-Call II* Signaling; Extended Tone "B" Group	68P81038E15
B589	Note 2	Public Address with Speaker Amplifier	68P81109E23
B330	Note 2	Public Address without Speaker Amplifier	68P81109E23
B549	Note 2	Public Address Speaker Amplifier	68P81109E22
B262	Note 2	Multiple *Digital Private-Line* Squelch	68P81109E25
B270	Note 2	Status/Message Terminal Interface	68P81109E27
B11	TRN6818A	Time-Out-Timer	68P81109E26

MAXAR High Band
Radio Set External Options Table

B80	TRN6209A	Non-Locking Installation Kit	Note 1
B62	TRN6524A	Security Screws	Note 3
B29	TRN6525A	Quick Mounting Screws for B80 Option	Note 3
B109	TMN6113A	Handset	68P81109E16
	TRN6319A	Handset Hang-up Box	68P81104E44
B18	TSN6022B	External Speaker	68P81109E24
B95	TRN6284A	Hang-Up Box with Switch for Models with B262 Option	68P81038E15
B22	TMN6104A/B	Palm Microphone used with Base Radio	Note 1
	TRN6318A	Base Tray with Microphone Clip	Note 3
B359	Note 2	Quick Disconnect Slide Mount Tray, Angle	68P81109E70
B360	Note 2	Quick Disconnect Slide Mount Tray, Flat	68P81109E70

Note 1. Covered in this publication.
Note 2. Refer to reference publication.
Note 3. No coverage required.

MOTOROLA INC.
Communications
Group

GENERAL SAFETY INFORMATION

The United States Department of Labor, through the provisions of the Occupational Safety and Health Act of 1970 (OSHA), has established an electromagnetic energy safety standard which applies to the use of this equipment. Proper use of this radio will result in exposure below the OSHA limit. The following precautions are recommended:

DO NOT operate the transmitter of a mobile radio when someone outside the vehicle is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of a fixed radio (base station, microwave and rural telephone rf equipment) or marine radio when someone is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of any radio unless all RF connectors are secure and any open connectors are properly terminated.

In addition,

DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.

All equipment must be properly grounded according to Motorola installation instructions for safe operation.

All equipment should be serviced only by a qualified technician.

Refer to the appropriate section of the product service manual for additional pertinent safety information.

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OPERATING INSTRUCTIONS

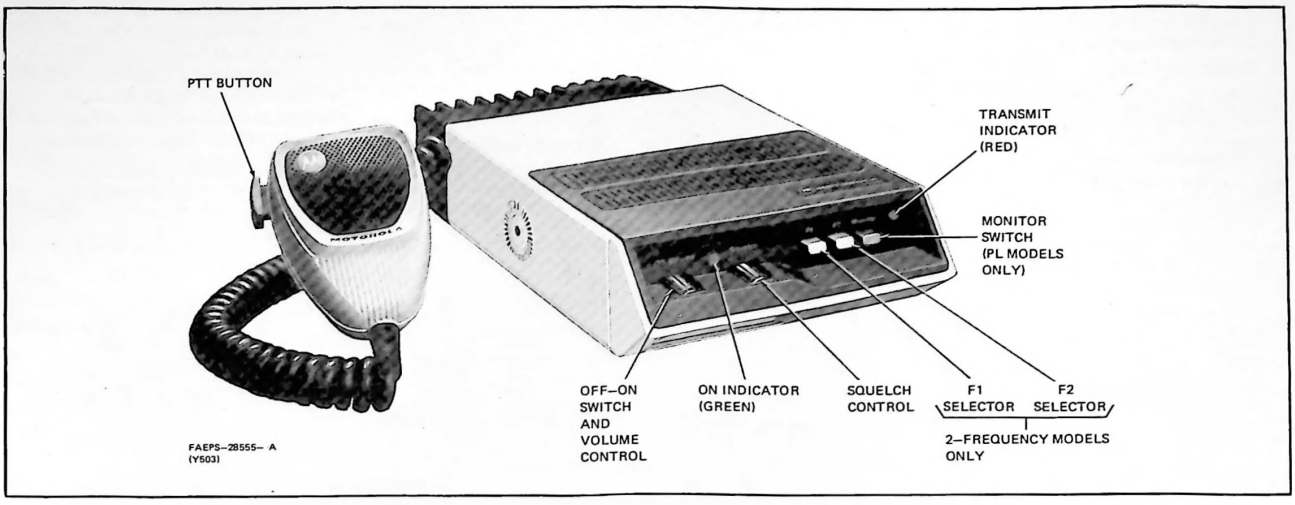


Figure 1.
Operating Controls and Indicators

1. TO TURN ON RADIO

The on-off switch for the radio set is operated by the OFF-VOLUME control. To turn on the radio set, rotate the OFF-VOLUME control knob clockwise until a click is heard. The front panel lamps then turn on to illuminate the control labels and the green ON indicator.

NOTE

When operating in extremely cold ambient temperature conditions (-10 to -30° C), allow 2 minutes after radio is turned on before transmitting to ensure compliance with FCC rules and regulations.

2. TO RECEIVE

Operation	Procedure
1. Disable PL (PL models only)	Press MONITOR button so itstays in. —OR— Remove microphone from hang-up box (mandatory if radio is not equipped with monitor button).
2. Unsquelch radio	Turn SQUELCH control counterclockwise until noise is heard.
3. Set VOLUME control	Adjust VOLUME control for a comfortable listening level.
4. Set SQUELCH control	Turn SQUELCH control clockwise until noise just stops.
5. Select operating frequency (two-frequency models only)	Press the desired frequency select button.
The radio is now adjusted to receive *all* messages on the selected frequency.	

Operation	Procedure
6. Enable PL (PL models only)	Press MONITOR button and allow it to return to the "out" position. —OR— If radio uses a microphone hang-up box, insert microphone into its hanger.
You are now able to hear messages for your system only.	

3. TO TRANSMIT

3.1 MOBILE RADIOS

Operation	Procedure
1. Select operating frequency (two-frequency models only)	Press the desired frequency select button.
2. Disable PL (PL models only)	Press MONITOR button so it stays in. —OR— Remove microphone from hang-up box (mandatory if radio is not equipped with monitor button).
3. LISTEN	DO NOT TRANSMIT if anyone is using the channel.
4. Key transmitter	Press and hold down microphone PTT button. Red light on radio front panel will glow indicating that the transmitter is "on-the-air"
5. Transmit message	Hold microphone about 2 inches from your lips and speak slowly into microphone at a normal voice level. Shouting does not make your message easier to understand. Make each transmission as brief as possible.

Operation	Procedure
6. Receive reply	Release microphone PTT button.
7. Enable PL at end of conversation (PL models only)	Press MONITOR button and allow it to return to the "out" position. —AND— Insert microphone into its hanger.

3.2 BASE STATION RADIOS

Operation	Procedure
1. Select operating frequency (two-frequency models only)	Press one of the frequency select buttons as needed.
2. Disable PL (PL models only) and monitor the radio channel	Depress the microphone MONITOR switch and briefly listen for conversation on the radio channel.
3. Transmit the message	If the radio channel is not in use, depress and hold both the microphone MONITOR and TRANSMIT switches while speaking about 6 inches from the microphone. Speak distinctly and at a normal level. Release the TRANSMIT switch at the end of the message or to receive a reply.
4. Enable receiver muting (PL and DPL models)	At the end of the message or conversation release the microphone MONITOR switch.

NOTE

If JU2 is removed from the microphone both the microphone TRANSMIT and MONITOR buttons must be pressed to transmit — releasing either switch ends the transmission.

PREINSTALLATION INSTRUCTIONS

1. UNPACKING

When unpacking the radio from its shipping carton, refer to the model chart at the front of this manual. If any item is missing, contact your Motorola representative immediately.

2. LICENSING REQUIREMENTS

FCC regulations state that a station license must be obtained for each radio installation (mobile or base) by the owner of the equipment. The station licensee is responsible for ensuring that the transmitter power, frequency, and deviation are within the limits permitted under the station license. Adjustments to the transmitter section of the radio may be made only by a technician possessing an FCC first or second class radiotelephone operator's license. No operator's license is required to install or operate the radio.

3. BENCH CHECK

3.1 INTRODUCTION

Each radio set is adjusted, tested, and inspected before shipment. However, it is recommended that both the transmitter and receiver sections of the radio be checked for proper operation just prior to installation.

3.2 TESTING

The radio should be tested with all cables and accessories supplied with the radio connected as they will be in the final installation. The frequency, deviation, and output power of the transmitter should be checked, as well as the sensitivity, squelch operation, and audio quality of the receiver. Radios with PL or DPL capabilities should be operated in the coded squelch mode to verify proper encode/decode performance. Refer to the specifications page at the front of this manual to determine whether the radio is operating properly. Improper operation can generally be corrected by touching up the receiver or transmitter alignment.

4. INSTALLATION PLANNING — MOBILE RADIOS

4.1 GENERAL

Planning is the key to fast, easy radio installation. Before a hole is drilled or a wire is run, inspect the vehicle and determine how and where you intend to mount the antenna, radio set, and accessories. Plan wire and cable runs to provide maximum protection from pinching, crushing, and overheating.

4.2 ANTENNA MOUNTING

The best mounting location for the antenna is in the center of a large, flat conductive surface. In almost all vehicles these requirements are best satisfied by mounting the antenna at the center of the roof. Some vehicles have a large trunk lid that will provide a good antenna location. If the trunk lid is used, connect grounding straps between the trunk lid and vehicle chassis to insure that the trunk lid is at chassis ground.

4.3 RADIO MOUNTING

4.3.1 General

4.3.1.1 The Model TLN5992A Locking Trunnion consists of a two piece trunnion type mounting bracket equipped with a key lock and associated mounting screws and is designed to facilitate easy removal. The locking trunnion may be mounted on either metal or plastic surfaces.

4.3.1.2 The optional trunnion mount (p/o TRN6209A Installation Kit) allows the radio set to be mounted to a variety of mounting surfaces. Be sure the mounting surface is able to adequately support the weight of the radio. Allow sufficient space around the radio for free air flow for cooling. Be sure the unit is close enough to the vehicle operator to permit easy access to operating controls.

4.3.2 Inverted Escutcheon Installation

A front panel escutcheon with inverted lettering (Motorola Option B96) is available if you plan to mount the radio above the operator's normal line of sight. Install the inverted escutcheon as follows:

Step 1. Remove the radio chassis from its housing (See Housing Removal procedure in Service section).

Step 2. Using a long screwdriver, push on the back of the upright escutcheon until it is free of the radio housing front panel.

Step 3. Remove the tape from the back of the inverted escutcheon. Press the inverted escutcheon onto the radio housing front panel.

Step 4. Pull the pushbuttons off the F1, F2, and monitor switches. Invert the pushbuttons and replace them on the switches.

Step 5. Reinstall the radio chassis into the housing. Be sure the chassis locking tabs properly engage the slots in the housing.

4.4 DC POWER AND WIRING

4.4.1 This radio must be operated *only* in negative-ground electrical systems. Reverse polarity will not damage the radio, but the cable fuse will blow. Check the vehicle ground polarity before you begin installation to prevent wasted time and effort.

4.4.2 Connect the red power lead through F601 to the vehicle battery positive terminal. Connecting the red lead to any other positive voltage point in the vehicle is *not recommended.*

CAUTION

If dc power is to be controlled by the vehicle ignition switch, a switching relay (Motorola Part No. 59-813674) should be used to switch the red power lead. The vehicle ignition switch, then, controls dc to the relay coil.

4.4.3 Connect the black power lead to a good ground point on the vehicle chassis. *Do not* connect the black lead directly to the battery negative terminal.

4.4.4 The wiring provided with the radio is of sufficient size to handle the maximum radio current demand. If wiring must be added to that provided, be sure the gauge of the added wire is sufficient for the current to be carried and length of the added run.

5. INSTALLATION PLANNING—BASE STATIONS

5.1 ANTENNA SYSTEM

Selecting the antenna system for your base radio depends on factors beyond the scope of this manual. Your Motorola representative can help you choose the antenna system that will best serve your particular needs.

5.2 RADIO LOCATION

Choose a location for your base radio as close as possible to where the antenna cable enters the building. Be sure 117 volt, 60 Hz power is available. Make sure sufficient air can flow around the radio to permit adequate cooling.

INSTALLATION INSTRUCTIONS

1. MOBILE RADIOS USING TLN5992A LOCKING TRUNNION

1.1 MOUNTING CONSIDERATIONS

Before attempting to install the locking trunnion examine the vehicle for suitable mounting locations. The bracket requires a flat mounting surface at least 8″ x 2″ with adequate clearance for inserting the radio set. The chosen location should also be convenient to the vehicle operator and provide access to power and antenna connections. Be careful to choose a location which permits the locking trunnion to be removed from the mounting bracket. Vehicle operation should in no case be impaired.

1.2 INSTALLATION
(Refer to Figure 2)

Step 1. Using the mounting bracket as a template, drill six 3/32-inch holes. If mounting on plastic surface, use metal backing plate to strenghten installation.

Step 2. Using the six #10-16 x 3/4" screws provided, attach the mounting bracket to the mounting surface. Allow 3/4 inch clearance in front of the bracket so locking trunnion may be inserted.

Step 3. Attach radio to locking trunnion using the two #10-32 x 1/2" screws provided in the radio.

Step 4. Insert the locking trunnion into the mounting bracket by first sliding the large flanges into the slots at the rear of the mounting bracket and then sliding the small locking flanges into the slots at the front of the mounting bracket.

Step 5. Lock the locking trunnion into the mounting bracket using the key provided.

Step 6. Perform Steps 2 through 9 in paragraph 2.

2. MOBILE RADIOS USING OPTIONAL TRUNNION MOUNTING BRACKET

Step 1. Mount the radio set trunnion mounting bracket. See Figure 3.

Step 2. Mount the antenna, using the instructions provided with the antenna kit. Run the coaxial cable to the intended radio set mounting location. If necessary, cut off the excess cable and install the cable connector.

Step 3. Route power wiring, but do not make power connections and do not tie the wires down. Be sure to use grommets wherever the wiring must pass through a metal panel.

Step 4. Mount the microphone hanger or microphone hang-up box.

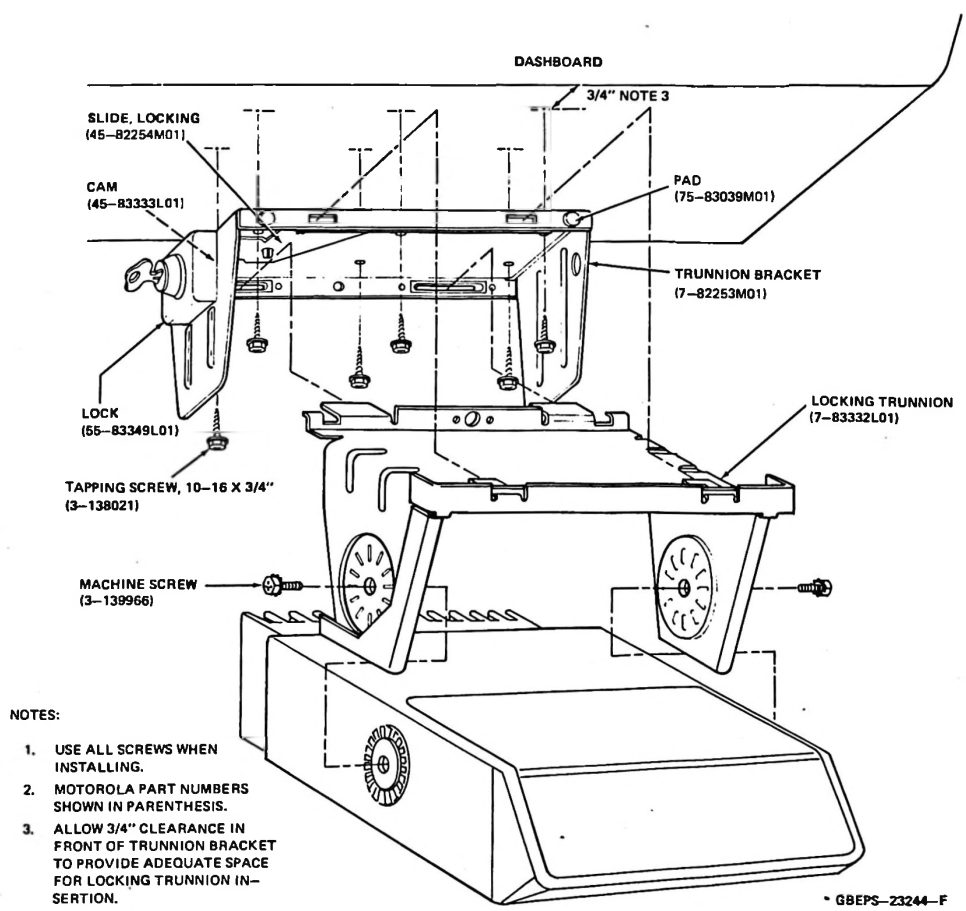


Figure 2.
Locking Trunnion Mounting

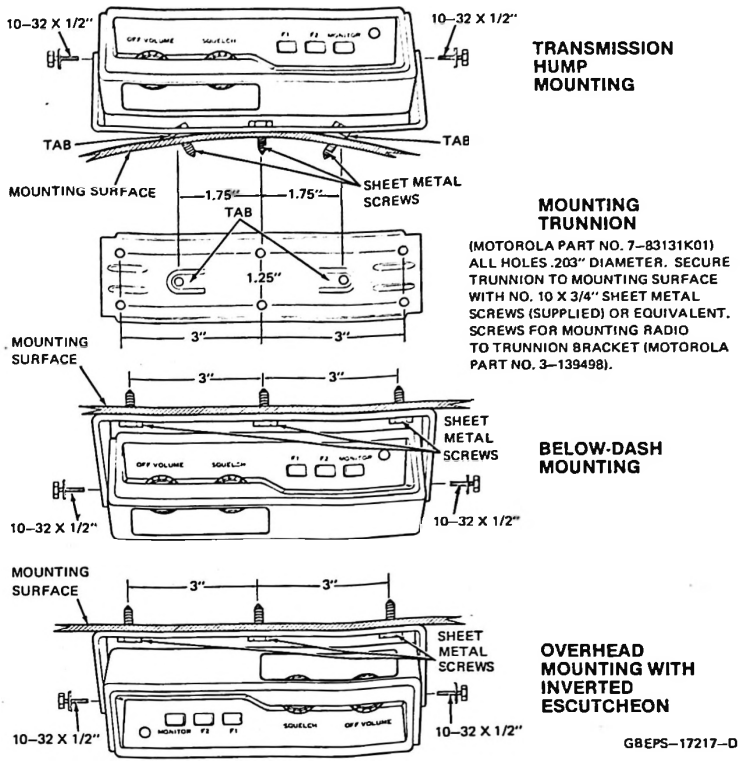


Figure 3.
Radio Mounting Detail

Step 5. Connect the power plug and coaxial cable connector to the radio set. See Figure 4. Install the radio in the mounting bracket.

Step 6. Complete the power wire routing. Be sure to leave sufficient slack wire behind the radio set to make the unit easy to remove and reinstall. Strap the wire down where necessary being sure the wires do not make contact with hot areas on the engine. Be sure the wires cannot be snagged by the operator's feet or during the normal vehicle operation. Cut off the excess power lead length and attach the terminal lugs supplied. Do not connect the leads to the battery at this time.

Step 7. If a microphone hang-up box or external speaker is used, secure wiring to those items as needed. Allow sufficient slack in wiring for future maintenance.

Step 8. Connect the power leads. Be sure the connection points are clean and free of paint, dirt, and corrosion.

Step 9. Test radio and its accessories for proper system operation. Check the antenna SWR, using an in-line wattmeter.

NOTE

After installation, remove the protective film from the escutcheon. To remove any dust accumulation from the escutcheon, always wipe with a damp cloth.

3. BASE STATIONS

Step 1. Mount the radio set to the base mounting tray.

Step 2. Connect the power cable to the radio set and to the power supply output jack.

Step 3. Connect an in-line wattmeter between the radio antenna connector and the antenna system.

Step 4. Plug the base dc power supply into the 117 volt, 60 Hz outlet. Set the power supply AC POWER switch to the ON POSITION.

Step 5. Key the transmitter and check the antenna system VSWR. If the VSWR is 3:1 or lower, disconnect the wattmeter and connect the antenna coaxial cable to the radio set antenna jack.

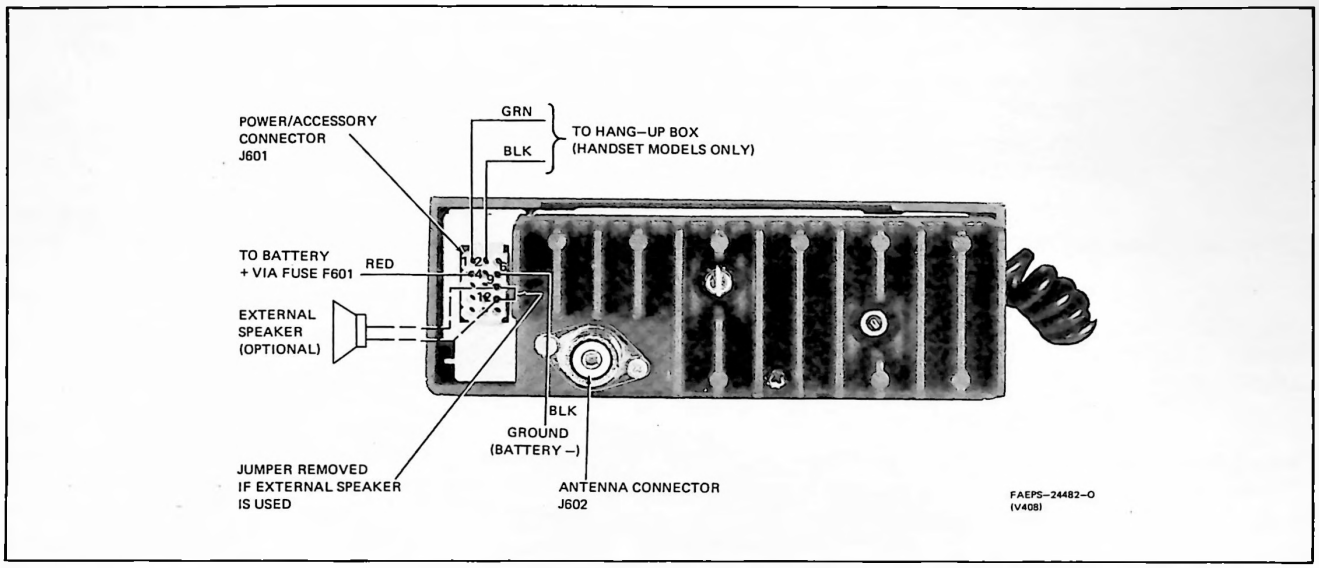


Figure 4.
Connections to Radio Set Rear Panel

Step 6. Test the radio set and accessories for proper operation. A brief conversation with a mobile unit in your system will indicate whether the base station is operating satisfactorily.

NOTE

After installation, remove the protective film from the escutcheon. To remove any dust accumulation from the escutcheon, always wipe with a damp cloth.

SERVICE

1. INTRODUCTION

This radio is designed for easy servicing. All of the metering points are brought out to radio set power connector J601. For servicing information, refer to the schematic diagrams, circuit board details, and alignment procedures in this manual. Theory of operation is shown on the schematic diagrams.

2. HOUSING REMOVAL

(Refer to Figure 5)

Step 1. Remove the radio set from the trunnion mount.

Step 2. Insert a screwdriver blade into the screwdriver slot near the bottom of the radio chassis rear panel.

Step 3. Push the screwdriver against the housing until the chassis locking tabs clear the slots in the radio housing.

Step 4. Slide the radio chassis out the back of the housing.

3. WIRE REPLACEMENT—POWER PLUG P601

Two special wire extraction tools are available to remove wires from power plug P601; ST1145 for 0.062" diameter pins (1-15); ST946 for 0.093" diameter pins (A and B). This tool must be used for ease of wire extraction and to prevent damage to the connector or its pins.

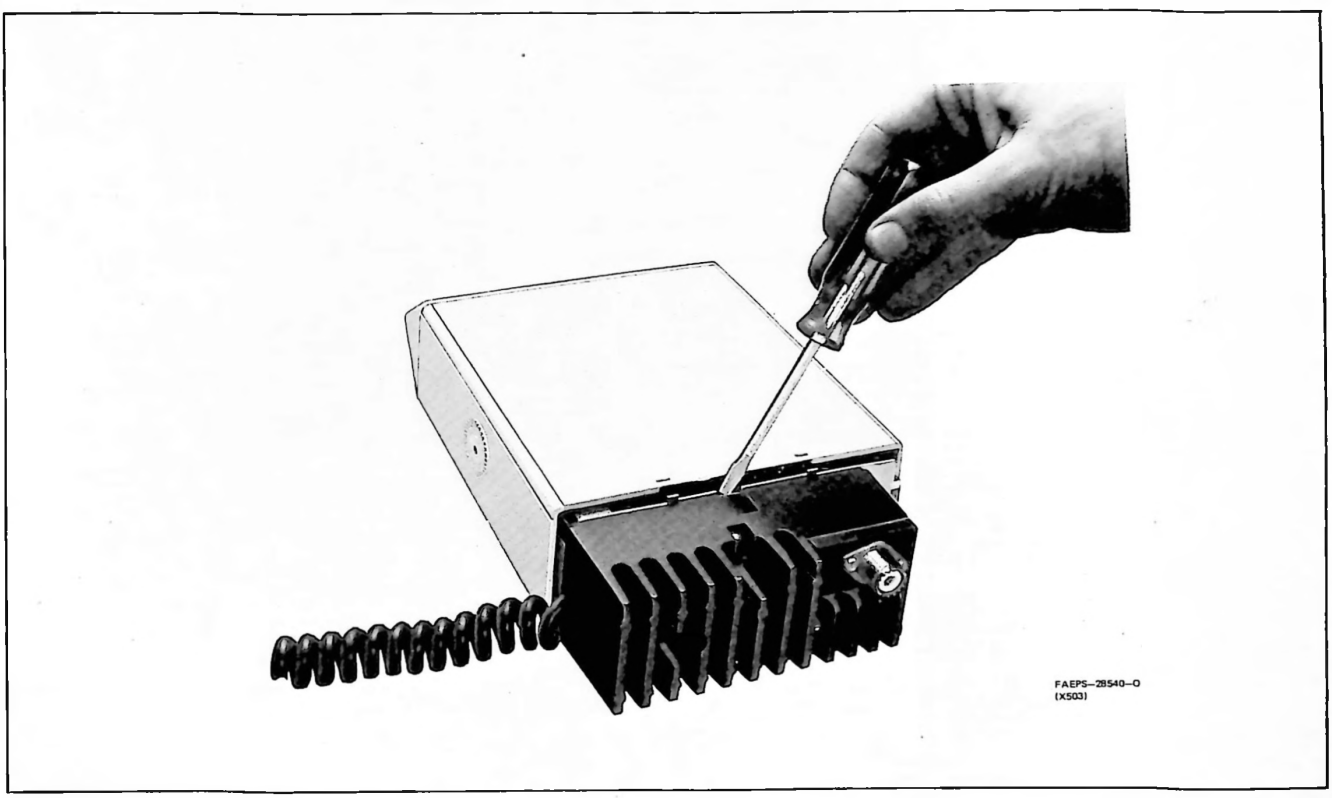
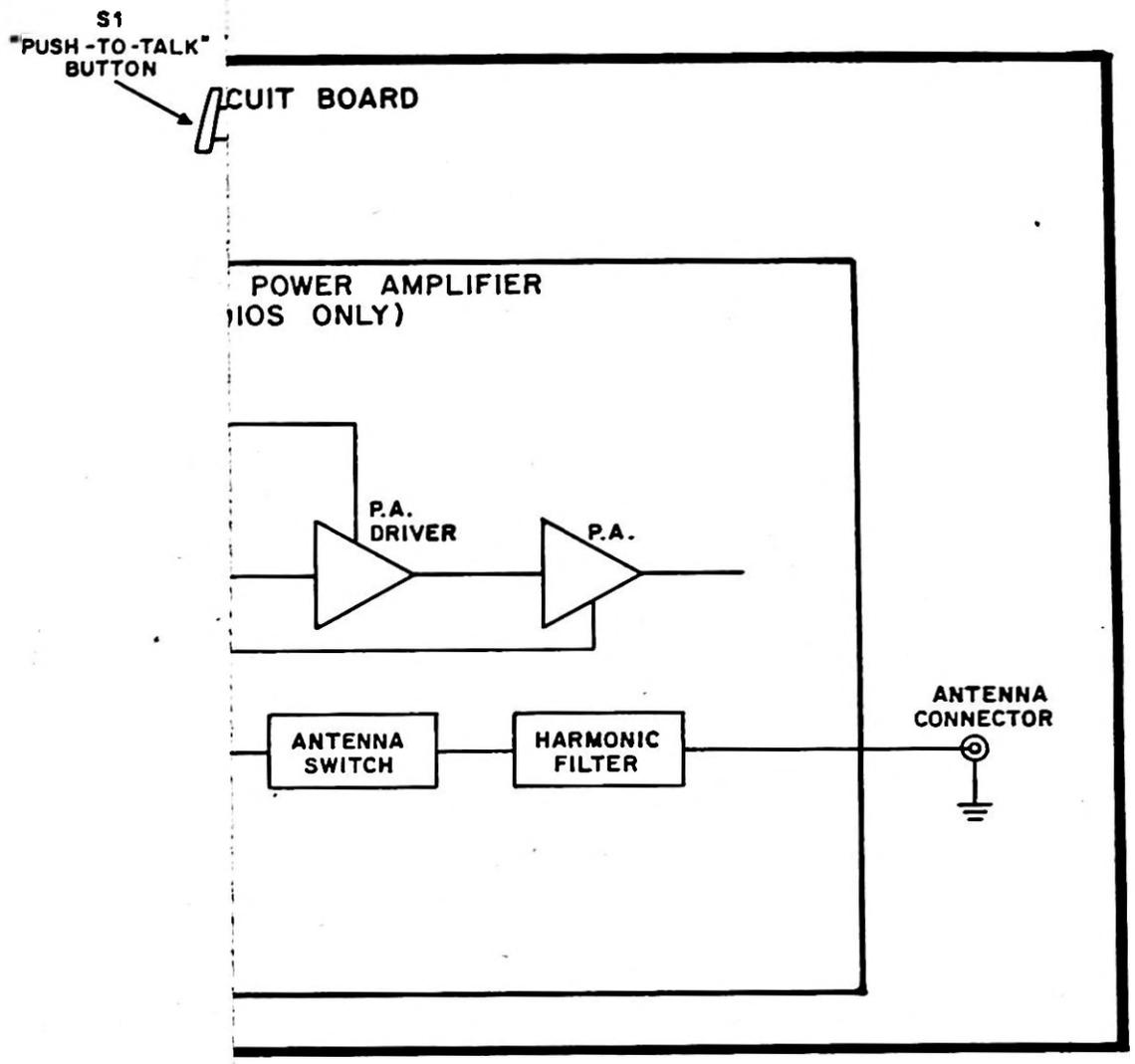


Figure 5.
Housing Removal

FUNCTIONAL INTERCONNECT DIAGRAM



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NOTES:

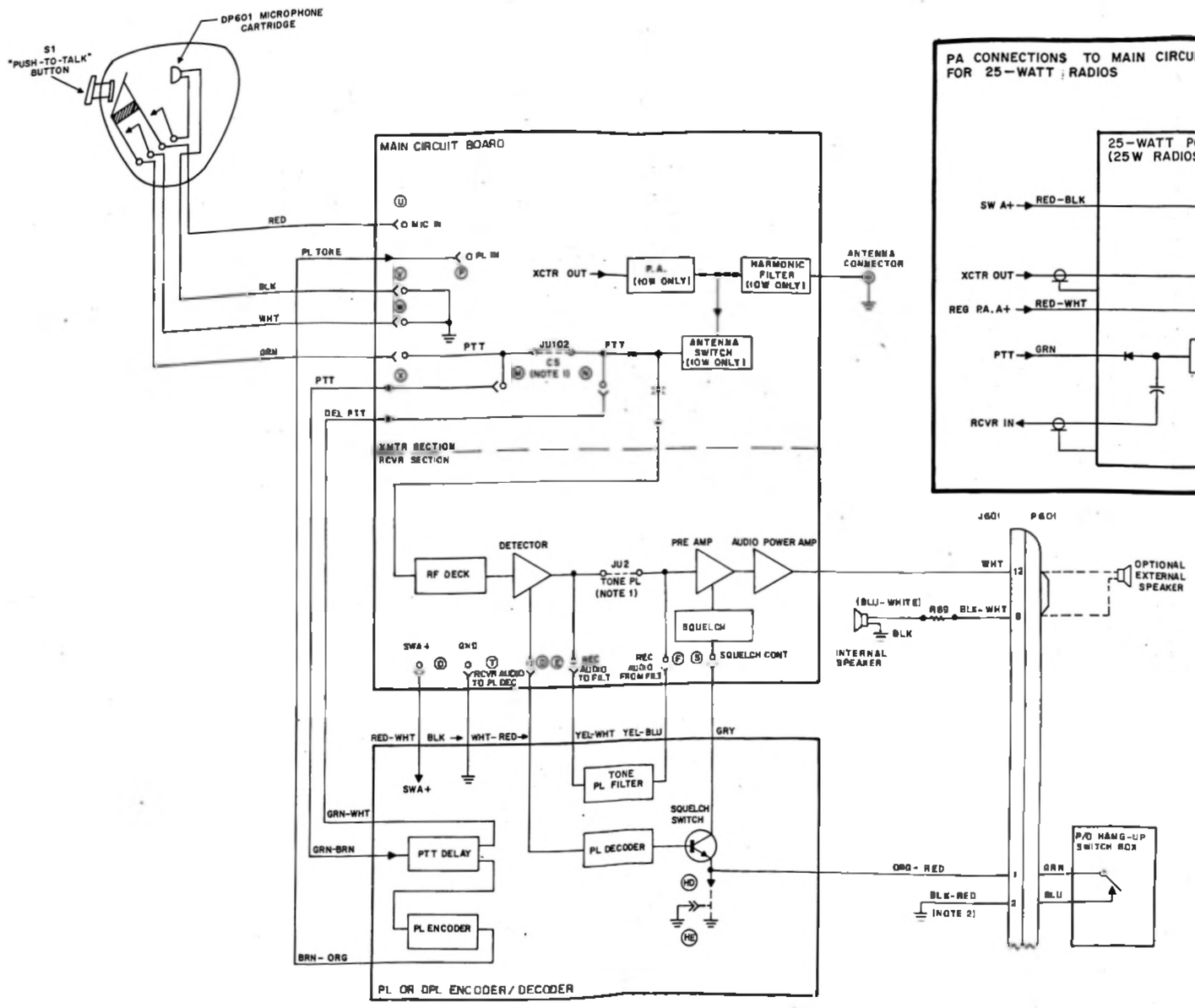
1. JU2 OUT FOR TONE PL SQUELCH RADIOS. JU102 ADDED FOR CARRIER SQUELCH RADIOS.
2. A) P601–2 RETURNED TO GROUND VIA BLK–RED LEAD TO "PRIVATE–LINE" OR "DIGITAL PRIVATE–LINE" ENCODER BOARD ON "PRIVATE–LINE" AND "DIGITAL PRIVATE–LINE" MODELS.

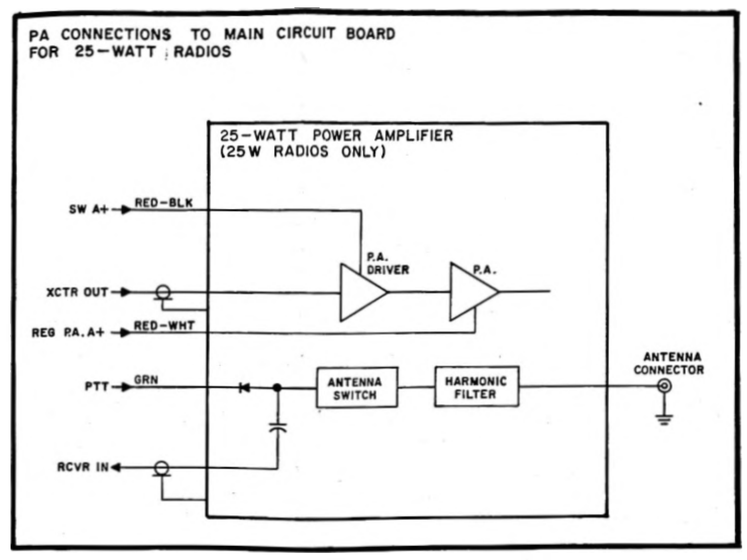
   B) IF HANG–UP BOX IS USED WITH CARRIER SQUELCH RADIO (TO RESET OPTIONAL DECODER), GROUND RETURN WIRE (P/O TRN6209A GROUND WIRE KIT) MUST BE ADDED FROM P601–2 TO CHASSIS.

   C) IF "QUIK–CALL" DECODER WITH HORN AND LIGHT OPTION IS USED, GROUND RETURN FOR HANG–UP BOX IS MADE VIA TRN6810A GROUND EXTENDER KIT AND P601–2 IS USED FOR ANOTHER FUNCTION.
3. WHEN THE OPTIONAL EXTERNAL SPEAKER IS USED, THE JUMPER BETWEEN PINS 9 AND 12 OF ACCESSORY POWER CONNECTOR P601 IS REMOVED.

• DEPS–24823–B

FUNCTIONAL INTERCONNECT DIAGRAM





NOTES:

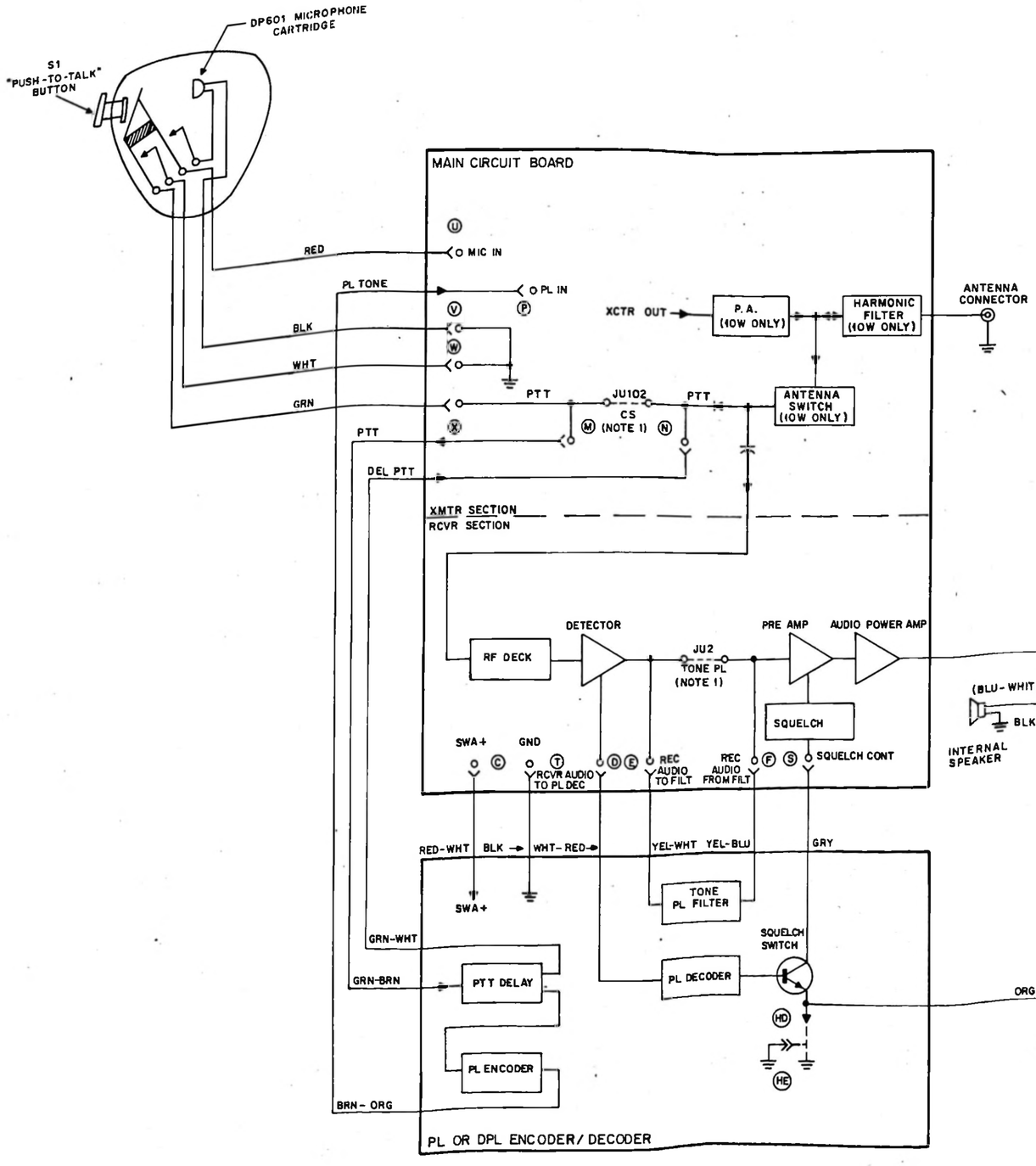
1. JU2 CUT FOR TONE PL SQUELCH RADIOS. JU102 ADDED FOR CARRIER SQUELCH RADIOS.
2. A) P601-2 RETURNED TO GROUND VIA BLK-RED LEAD TO "PRIVATE-LINE" OR "DIGITAL PRIVATE-LINE" ENCODER BOARD ON "PRIVATE-LINE" AND "DIGITAL PRIVATE-LINE" MODELS.

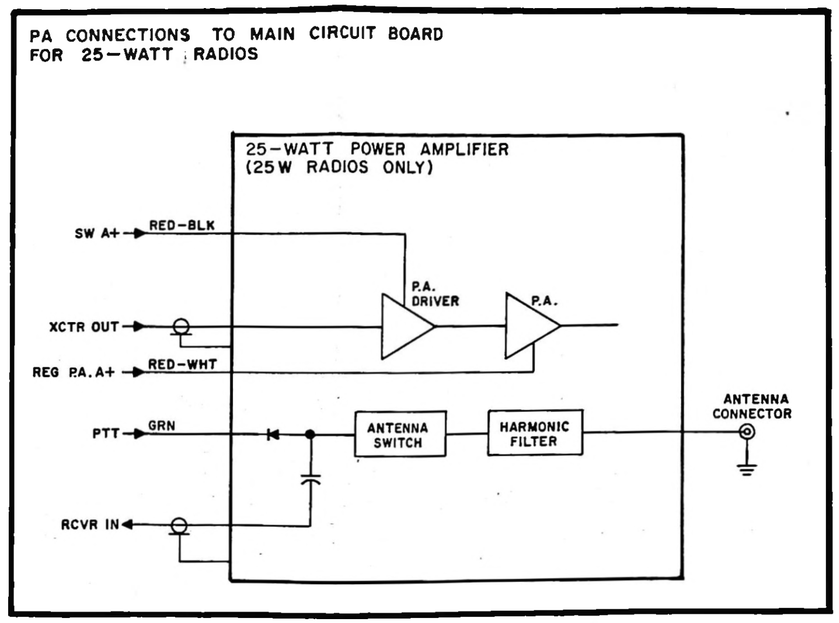
   B) IF HANG-UP BOX IS USED WITH CARRIER SQUELCH RADIO (TO RESET OPTIONAL DECODER), GROUND RETURN WIRE (P/O TRN6208A GROUND WIRE KIT) MUST BE ADDED FROM P601-2 TO CHASSIS.

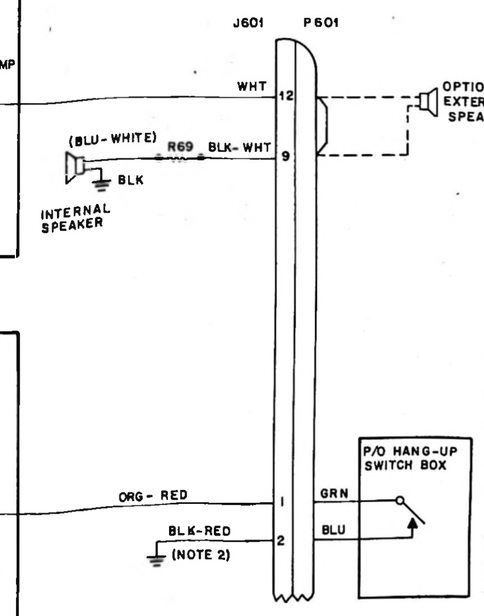
   C) IF "QUIK-CALL" DECODER WITH HORN AND LIGHT OPTION IS USED, GROUND RETURN FOR HANG-UP BOX IS MADE VIA TRN6210A GROUND EXTENDER KIT AND P601-2 IS USED FOR ANOTHER FUNCTION.
3. WHEN THE OPTIONAL EXTERNAL SPEAKER IS USED, THE JUMPER BETWEEN PINS 8 AND 12 OF ACCESSORY POWER CONNECTOR P601 IS REMOVED.

* DEPS-24823-B

FUNCTIONAL INTERCONNECT DIAGRAM







NOTES:

1. JU2 OUT FOR TONE PL SQUELCH RADIOS. JU102 ADDED FOR CARRIER SQUELCH RADIOS.
2. A) P601-2 RETURNED TO GROUND VIA BLK-RED LEAD TO "PRIVATE-LINE" OR "DIGITAL PRIVATE-LINE" ENCODER BOARD ON "PRIVATE-LINE" AND "DIGITAL PRIVATE-LINE" MODELS.

   B) IF HANG-UP BOX IS USED WITH CARRIER SQUELCH RADIO (TO RESET OPTIONAL DECODER), GROUND RETURN WIRE (P/O TRN6209A GROUND WIRE KIT) MUST BE ADDED FROM P601-2 TO CHASSIS.

   C) IF "QUIK-CALL" DECODER WITH HORN AND LIGHT OPTION IS USED, GROUND RETURN FOR HANG-UP BOX IS MADE VIA TRN6810A GROUND EXTENDER KIT AND P601-2 IS USED FOR ANOTHER FUNCTION.
3. WHEN THE OPTIONAL EXTERNAL SPEAKER IS USED, THE JUMPER BETWEEN PINS 9 AND 12 OF ACCESSORY POWER CONNECTOR P601 IS REMOVED.

• DEPS-24823-B

SAFE HANDLING OF CMOS INTEGRATED CIRCUIT DEVICES

Many of the integrated circuit devices used in communications equipment are of the CMOS (Complementary Metal Oxide Semiconductor) type. Because of their high open circuit impedance, CMOS ICs are vulnerable to damage from static charges. Care must be taken in handling, shipping, and servicing them and the assemblies in which they are used.

Even though protection devices are provided in CMOS IC inputs, the protection is effective only against overvoltage in the hundreds of volts range such as are encountered in an operating system. In a system, circuit elements distribute static charges and load the CMOS circuits, decreasing the chance of damage. *However, CMOS circuits can be damaged by improper handling of the modules even in a system.*

To avoid damage to circuits, observe the following handling, shipping, and servicing precautions.

1. Prior to and while servicing a circuit module, particularly after moving within the service area, momentarily touch *both* hands to a bare metal earth grounded surface. This will discharge any static charge which may have accumulated on the person doing the servicing.

NOTE

Wearing Conductive Wrist Strap (Motorola No. RSX-4015A) will minimize static buildup during servicing.

2. Whenever possible, avoid touching any electrically conductive parts of the circuit module with your hands.

3. Normally, circuit modules can be inserted or removed with power applied to the unit. However, check the INSTALLATION and MAINTENANCE sections of the manual as well as the module schematic diagram to insure there are no objections to this practice.

4. When servicing a circuit module, avoid carpeted areas, dry environments, and certain types of clothing (silk, nylon, etc.) because they contribute to static buildup.

5. All electrically powered test equipment should be grounded. *Apply* the *ground lead* from the test equipment to the circuit module *before* connecting the *test probe*. Similarly, *disconnect* the *test probe prior* to removing the *ground lead.*

6. If a circuit module is removed from the system, it is desirable to lay it on a conductive surface (such as a sheet of aluminum foil) which is connected to ground through 100k of resistance.

WARNING

If the aluminum foil is connected directly to ground, be cautious of possible electrical shock from contacting the foil at the same time as other electrical circuits.

7. When soldering, be sure the soldering iron is grounded.

8. Prior to connecting jumpers, replacing circuit components, or touching CMOS pins (if this becomes necessary in the replacement of an integrated circuit device), be sure to discharge any static buildup as described in procedure 1. Since voltage differences can exist across the human body, it is recommended that only one hand be used if it is necessary to touch pins on the CMOS device and associated board wiring.

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Communications Division

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12/15/78-PHI

9. When replacing a CMOS integrated circuit device, leave the device in its metal rail container or conductive foam until it is to be inserted into the printed circuit module.

10. All low impedance test equipment (such as pulse generators, etc.) should be connected to CMOS device inputs after power is applied to the CMOS circuitry. Similarly, such low impedance equipment should be disconnected before power is turned off.

11. Replacement modules shipped separately from the factory will be packaged in a conductive material. Any modules being transported from one area to another should be wrapped in a similar material (aluminum foil may be used). NEVER USE NON-CONDUCTIVE MATERIAL for packaging these modules.

TEST EQUIPMENT

METERING ADAPTER CABLES AND ADAPTER CABLE

ications
5 V dc /volt
5 V dc ohms
0 V ac ohms
uV-3 V n impedance
V-10 V/division usec.
00 Watts
-174 MHz Hz
0 kHz deviation 4 MHz
4 MHz ,000 uV st ± 3 kHz d by 1 kHz tone
20 kHz
200 Hz

POWER CONNECTOR P601
REMOVED FROM RADIO
CED WITH P101 OF THE
BLE ASSEMBLY.

SKN6029A, MAKE POWER
S FOLLOWS:

1-Ⓐ RING LUG TO POSITIVE TERMINAL
OWER SUPPLY OF PROPER TYPE.

1-Ⓑ TO NEGATIVE TERMINAL OF
R SUPPLY.

6030A, POWER CONNECTIONS
HE VEHICLE POWER CONNECTOR.
F THE ADAPTER CABLE TO THE
CABLE CONNECTOR.

dapter Cable

emarks
2 V ac meter range
l.

Cable
for M3, M5 and M7.

Motorola No. PEPS-30243-A
2/1/81-PHI

Required Test Equipment For "MAXAR" Radio Servicing

General Type	Application	Recommended Model	Min. Specifications
AC-DC VOM	DC voltage measurements, general	Motorola T1009	Measurement range: 0-15 V dc Sensitivity: 20,000 ohms/volt
DC Multimeter	DC voltage readings requiring a high input resistance meter	Motorola S1063	Measurement range: 0-15 V dc Input resistance: 11 megohms
AC Voltmeter	Audio voltage measurements	Motorola S1053	Measurement range: 0-10 V ac Input resistance: 10 megohms
RF Voltmeter	RF voltage measurements	Motorola S1339	Measurement range: 100 uV-3 V from 1 MHz-512 MHz Inputs: 50 ohms and high impedance
Oscilloscope	Waveform observation	Motorola R1004	Vertical sensitivity: 10 mV-10 V/division Horizontal time base: 1 usec. -1 sec/division
RF Wattmeter	Transmitter output power measurement	Motorola S1350 with appropriate element and T1013 RF Dummy Load	Measurement range: 0-100 Watts
Frequency Meter	Transmitter frequency measurement	Motorola R1200 Series, S1343 Series, or S1344 Series	Measurement range: 136-174 MHz Frequency resolution: 10 Hz
Deviation Meter	Transmitter modulation deviation measurement	Motorola R1200 Series, S1343 Series or S1344 Series	Measurement range: 0-10 kHz deviation Frequency range: 136-174 MHz
RF Signal Generator	Receiver alignment and troubleshooting	Motorola S1329	Frequency range: 136-174 MHz Output level: 0.1 uV-100,000 uV Must be capable of at least ± 3 kHz deviation when modulated by 1 kHz tone
Audio Signal Generator	Audio circuit troubleshooting	Motorola S1067	Frequency range: 20 Hz-20 kHz Output level: 50 mV-1 V
PL Tone Generator*	Tone-Coded "Private-Line" Decoder troubleshooting	Motorola SLN6221	Frequency range: 50 Hz-200 Hz Output level: 0-500 mV
DPL Test Set**	"Digital Private-Line" Encoder-Decoder troubleshooting	Motorola SLN6413	
Radio Test Set w/appropriate metering cable (SKN6029A for TEK-5 and SKN6030A for Portable Test Set)	Meter reading at circuit metering points for alignment and troubleshooting	Motorola S1056-59 Portable Test Set, TEK5B or C Metering Panel with TEK40 Conversion Kit, or TEK5E Metering Panel.	
10.7 MHz Signal Source	Adjustment of receive frequency	Motorola R1200 Series	1 mV output
Tuning Tool Kit	Receiver and transmitter alignment	Motorola TRN6210A	

* Required for tone-coded "Private- Line" Models only
** Required for "Digital Private- Line" Models only

Switch Positions For Models S1056-59 Portable Test Set With SKN6030A Metering Adapter Cable

Metering Point	Test Set Meter Selector Switch Position	Rcvr-Xmtr Accessories Switch Position	Meter Off-Rev Switch Position	Remarks
1	1	Rcv	Rev	
2	2	Rcv	Rev	
3	3	Xmtr	Rev	
5	5	Xmtr	Off	
7	7	Xmtr	Off	
Rcvr Audio	11	Rcvr	Off	2 V ac or 0.2 V ac meter range

NOTE: Radio must be keyed with XMTR ON button on test set when test cable is connected.

Switch Positions For TEK-5 Metering Panel With SKN6029A Metering Adapter Cable

1. Set TEK-5 Selector Switch to position C.
2. Set TEK-5 XMIT-REC Switch to REC position for M1, M2, and RCVR AUDIO. Set XMIT-REC switch to XMIT for M3, M5 and M7.

parts list

SKN6029A Metering Adapter Cable — PL-6813-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82783B10	1 uF, ± 20%; 50 V (not supplied as part of this kit, must be ordered separately)
		fuse, cartridge:
F1	65-86099	7.5 amp, 32 V
		connector, receptacle:
P101		connector, includes:
	15-80315A39	housing, receptacle; 15-pin with ears
	29-84706E03	terminal, male; 11 used
		connector, plug:
P1	9-855266	female, 20-contact
		resistor, fixed:
R1	6-124A89	47k ± 5%; 1/4 W
R2	6-10621E24	232k ± 1%; 1/8 W
R3	6-124C23	82 ± 10%; 1/4 W
R4	6-124A79	18k ± 5%; 1/4 W
	non-referenced parts	
	1-82779C01	FUSEHOLDER ASSEMBLY, includes:
	14-86882A01	BODY
	14-82883A01	CAP
	41-82885A01	SPRING
	42-82884A01	CLIP; 2 used
	2-9627	NUT, 4-40 x 3/16"; 2 used
	3-114831	SCREW, machine, 4-40 x 7/16"; 2 used
	3-138943	SCREW, tapping, 4-24 x 1/4"; 2 used
	4-7683	LOCKWASHER, internal, #4; 2 used
	29-82607B03	LUG; 2 used
	42-80313A05	STRAIN RELIEF; 2 used
	42-84066A60	TIE WRAP; 2 used

SKN6030A Metering Adapter Cable — PL-6814-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82783B10	1 uf ± 20%; 50 V (not supplied as part of this kit, must be ordered separately)
		fuse, cartridge:
F1	65-86099	7.5 amp, 32 V
		connector, receptacle:
J2		connector, includes:
	15-80315A39	housing, receptacle, 15-pin with ears
	29-84706E04	terminal, female; 2 used
		connector, plug:
P101		connector, includes:
	15-80315A40	housing, plug, 15-pin with ears
	29-84706E03	terminal, male; 11 used
P1		connector, includes:
	15-84821B10	housing
	15-84819B01	end cover, right hand
	15-80313A03	end cover, left hand
	9-84306A96	connector, female, 10-contacts 1, 2-18
	9-84306A97	connector, female, 10-contacts 3, 4-20
		resistor, fixed:
R1	6-124A89	47k ± 5%; 1/4 W
R2	6-10621E24	232k ± 1%; 1/8 W
R3	6-124C23	82 ± 10%; 1/4 W
		switch:
S1	40-82148F01	SPDT
	non-referenced parts	
	1-82779C01	FUSEHOLDER ASSEMBLY, includes:
	14-86882A01	BODY
	14-82883A01	CAP
	41-82885A01	SPRING
	42-82884A01	CLIP; 2 used
	2-9627	NUT, 4-40 x 3/16"; 2 used
	3-114831	SCREW, machine, 4-40 x 7/16"; 2 used
	4-7683	LOCKWASHER, internal, #4; 2 used
	42-80313A05	STRAIN RELIEF; 2 used
	42-83345E01	CABLE CLAMP
	42-84066A60	TIE WRAP; 2 used

parts list

SKN6029A Metering Adapter Cable — PL-6813-O

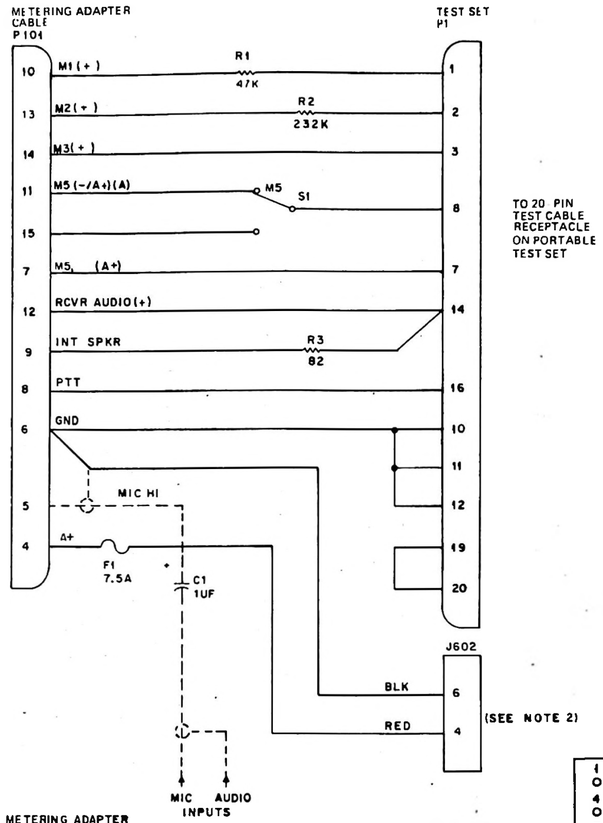
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82783B10	1 uF, ± 20%; 50 V (not supplied as part of this kit, must be ordered separately)
		fuse, cartridge:
F1	65-86099	7.5 amp, 32 V
		connector, receptacle:
P101		connector, includes:
	15-80315A39	housing, receptacle; 15-pin with ears
	29-84706E03	terminal, male; 11 used
		connector, plug:
P1	9-855266	female, 20-contact
		resistor, fixed:
R1	6-124A89	47k ± 5%; 1/4 W
R2	6-10621E24	232k ± 1%; 1/8 W
R3	6-124C23	82 ± 10%; 1/4 W
R4	6-124A79	18k ± 5%; 1/4 W
		non-referenced parts
	1-82779C01	FUSEHOLDER ASSEMBLY, includes:
	14-86882A01	BODY
	14-82883A01	CAP
	41-82885A01	SPRING
	42-82884A01	CLIP; 2 used
	2-9627	NUT, 4-40 x 3/16"; 2 used
	3-114831	SCREW, machine, 4-40 x 7/16"; 2 used
	3-138943	SCREW, tapping, 4-24 x 1/4"; 2 used
	4-7683	LOCKWASHER, internal, #4; 2 used
	29-82607B03	LUG; 2 used
	42-80313A05	STRAIN RELIEF; 2 used
	42-84066A60	TIE WRAP; 2 used

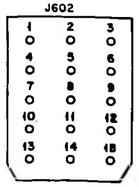
SKN6030A Metering Adapter Cable — PL-6814-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82783B10	1 uf ± 20%; 50 V (not supplied as part of this kit, must be ordered separately)
		fuse, cartridge:
F1	65-86099	7.5 amp, 32 V
		connector, receptacle:
J2		connector, includes:
	15-80315A39	housing, receptacle, 15-pin with ears
	29-84706E04	terminal, female; 2 used
		connector, plug:
P101		connector, includes:
	15-80315A40	housing, plug, 15-pin with ears
	29-84706E03	terminal, male; 11 used
P1		connector, includes:
	15-84821B10	housing
	15-84819B01	end cover, right hand
	15-80313A03	end cover, left hand
	9-84306A96	connector, female, 10-contacts 1, 2-18
	9-84306A97	connector, female, 10-contacts 3, 4-20
		resistor, fixed:
R1	6-124A89	47k ± 5%; 1/4 W
R2	6-10621E24	232k ± 1%; 1/8 W
R3	6-124C23	82 ± 10%; 1/4 W
		switch:
S1	40-82148F01	SPDT
		non-referenced parts
	1-82779C01	FUSEHOLDER ASSEMBLY, includes:
	14-86882A01	BODY
	14-82883A01	CAP
	41-82885A01	SPRING
	42-82884A01	CLIP; 2 used
	2-9627	NUT, 4-40 x 3/16"; 2 used
	3-114831	SCREW, machine, 4-40 x 7/16"; 2 used
	4-7683	LOCKWASHER, internal, #4; 2 used
	42-80313A05	STRAIN RELIEF; 2 used
	42-83345E01	CABLE CLAMP
	42-84066A60	TIE WRAP; 2 used

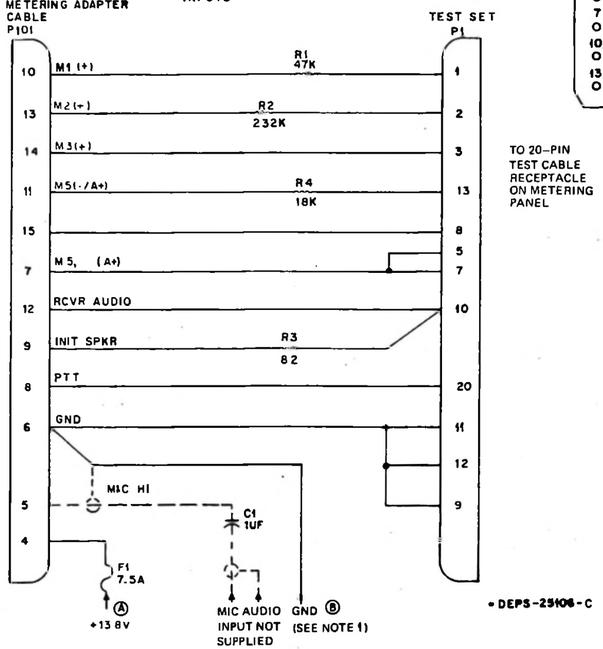
SKN6030A METERING ADAPTER CABLE

(FOR USE WITH MODEL S1056-59 PORTABLE TEST SET)





MATES WITH POWER CONNECTOR P601 WHICH WAS REMOVED FROM RADIO AND REPLACED WITH P101 OF THE TEST SET CABLE ASSEMBLY.



• DEPS-25106-C

NOTES:

1. WHEN USING THE SKN6029A, MAKE POWER CONNECTIONS AS FOLLOWS:
   1. ATTACH P101-Ⓐ RING LUG TO POSITIVE TERMINAL OF BENCH POWER SUPPLY OF PROPER TYPE.
   2. ATTACH P101-Ⓑ TO NEGATIVE TERMINAL OF BENCH POWER SUPPLY.
2. WHEN USING SKN6030A, POWER CONNECTIONS ARE MADE VIA THE VEHICLE POWER CONNECTOR. CONNECT J602 OF THE ADAPTER CABLE TO THE VEHICLE POWER CABLE CONNECTOR.

SKN6029A METERING ADAPTER CABLE

(FOR USE WITH MODEL TEK-5B OR C METERING PANEL EQUIPPED WITH TEK-40 CONVERSION KIT OR TEK-5E METERING PANEL)

TRANSMITTER ALIGNMENT

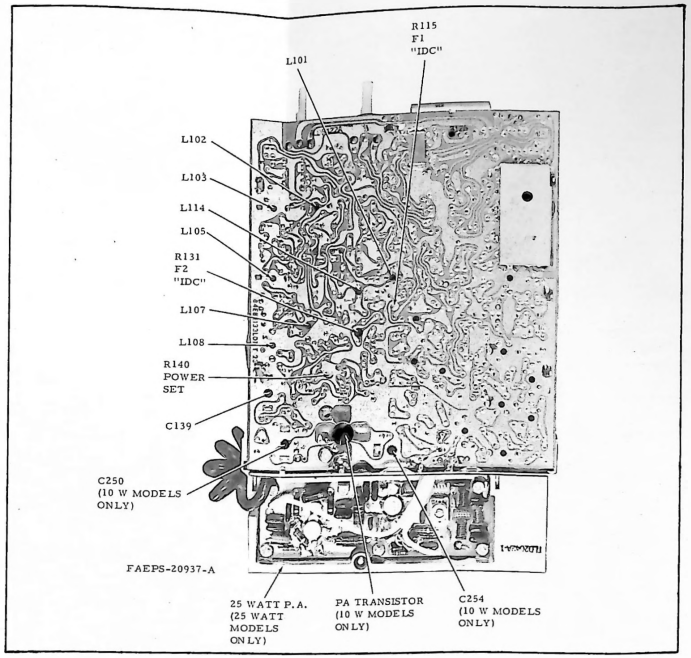


Figure 1. Transmitter Adjustment Locations

TRANSMITTER METERING TABLES

Table 1. Transmitter Meter Readings Using TEK-5 Metering Panel or S1056 Portable Test Set

Meter	Measurement	Reading (uA)	Remarks
3	Buffer Amplifier Input	8 (min.)	
5	Exciter Output Amplifier Collector Current	12 (typ.) 18 (max.)	
7	PA Current 10-Watt Models	11 (typ.) 16 (max.)	Multiply M7 x .14 to obtain PA final current in amps.
	25-Watt Models	15 (typ.) 18 (max.)	Multiply M7 x .25 to obtain PA final current in amps.
Voltmeter between meter 7 point & chassis ground	PA Voltage		
	PA Input Power		Multiply PA voltage by PA current

Table 2. Transmitter Metering Readings Using 20,000 Ohm/Volt Voltmeter

Metering Function	Voltmeter Lead Connections +	—	Voltmeter Scale	Typical Readings
M3 Buffer Ampl. Input	J601-14	Chassis Ground	50 uA, dc	6 uA (min.)
M5 Exciter Output Amplifier Collector Current	J601-7	J601-11	1 mA, dc	.17 mA (typ.) .22 mA (max.)
M7 PA Current	J601-7	J601-15	500 mA, dc	240 mA (typ.) 290 mA (max.)

PREALIGNMENT NOTES

1. In some cases, peak reading may occur at two points in the tuning range of a coil. Always choose point where slug is nearest top of coil form (away from circuit board).

2. Unnecessary tuning adjustments should be avoided. Usually, only a "touch-up" transmitter alignment is needed. Complete transmitter alignment is needed in the following cases:

   a. After changing transmitter operating frequency.
   b. After replacing a component in a frequency-sensitive network.

3. Before beginning a complete alignment, preset tuning adjustments as follows:

   a. Set C139, and C250 and C254 (in 10-watt models) or C210 (in 25-watt models) 1/4 turn counterclockwise from tight.

   b. Set L101 (and L114 in 2-frequency models) 7 turns from top of coil form (away from circuit board).

NOTE
Low or no meter 3 reading will be obtained if L101 and L114 are not properly preset.

   c. Set L102, L103, L105, L107, and L108 according to Figure 2.

   d. Set power set control R140 fully counterclockwise (viewed from solder side of board) for maximum transmitter power output.

4. Key transmitter for each step in alignment procedure and de-key after alignment step is completed.

CAUTION
Avoid keying an unaligned transmitter for prolonged periods.

5. Transmitter frequency calculations:

   $f_c = 9f_{osc}$, where f_c = carrier frequency, and f_{osc} = crystal oscillator frequency.

6. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable. The metering adapter cables and directions for their use are shown in the Test Equipment section. Metering may be accomplished with a 20,000 ohm-per-volt voltmeter if a test set or metering panel is not available. Refer to the transmitter metering tables on this page.

7. Connect an rf wattmeter, terminated in a resonant antenna or 50-ohm resistive dummy load, to radio set antenna connector J602.

8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.8 volts.

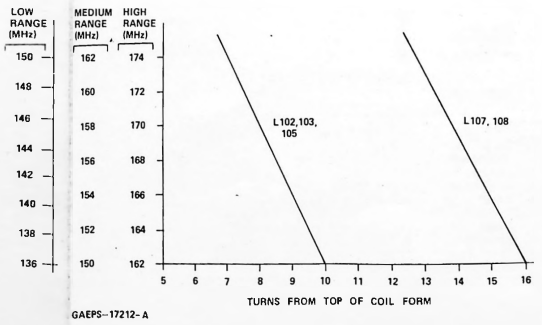


Figure 2. Coil Preset Chart

NOTE
Two-frequency radios should be tuned on lowest frequency.

EXCITER ALIGNMENT

Step	Adjust	Metering Point	Desired Reading
1 Oscillator Output	L102, then L103	M3	Peak
2 Buffer Output	L105	M3	Dip if no M5 reading.
		M5	Peak
3 Tripler Output	L107, then L108	M5	Peak
4 Exciter Output	C139	M7	Peak

10-WATT POWER AMPLIFIER ALIGNMENT

Step	Adjust	Metering Point	Desired Reading
1 PA Input	C250	RF Output	Peak wattmeter reading.
2 PA Output	C254	RF Output	Peak wattmeter reading.
3 Tripler	Repeak L107, then L108	RF Output or M5	Peak wattmeter reading or peak M5 reading.
4 PA Output	C139, then C250, then C254	RF Output	Peak wattmeter reading.
5 Drive Regulator	R140 Power Set	RF Output and M7	12 watts with M7 less than 16 uA (see Note).

25-WATT POWER AMPLIFIER ALIGNMENT

Step	Adjust	Metering Point	Desired Reading
1 PA Output	C210	RF Output	Peak wattmeter reading.
2 Osc Output	L102	RF Output	Detune to approximately 10 watts (keep P.A. out of saturation for Steps 3 and 4).
3 Tripler Output	L107 & L108	RF Output or M5	Peak wattmeter reading or peak M5 reading.
4 Exciter Output	C139	RF Output	Peak wattmeter.
5 Osc Output	L102	RF Output M3	Peak wattmeter.
6 Drive Regulator	R140 Power Set	RF Output & M7	Adjust for 28 watts with M7 less than 16 uA (see Note).

WIDE SPACE TUNE-UP PROCEDURE

This procedure is used for two-frequency radios with the total channel separation in excess of 300 kHz but not exceeding 2 MHz. In low range radios (136-150.8 MHz) the wide space limit is 1.8 MHz. Tune-up exciter and power amplifier on the lowest frequency as described above. Leave power set control R140 set for maximum power out.

Step	Adjust	Metering Point	Desired Reading
1 Oscillator	L102	M3	Alternately switch between the lowest and the highest transmit frequencies and adjust L102 for equal reading on meter 3.
2 Tripler	L107	RF Output M5 (low range radios only)	Alternately switch between the lowest and the highest transmit frequencies and adjust L107 for equal power output. In low range radios L107 should be adjusted to equal M5 readings on both frequencies.
3 Power Set	R140	RF Output and M5	Set R140 on the lowest frequency for 12-watt output on 10-watt models and 28-watt output on 25-watt models. Check that meter 5 reading is at least 1 uA less than the maximum meter 5 reading when R140 was fully counterclockwise. With channel separations in excess of 1.2 MHz but not exceeding 2 MHz, power output is 6 watts on 10-watt models and 15 watts on 25-watt models.
4 Oscillator Output	L102	M3	Repeat Step 1.
5 Oscillator Output	L102	M3	After oscillators are set on frequency, recheck M3 balance (Step 1).
6 Low Range Radios Only	L107	M5	With power supply voltage set to 10 V dc, select the frequency which has the least rf output. Maximize the output of this frequency by adjusting L107. Do not adjust to degrade the output of the other frequency. Always adjust to *raise* the rf level of one frequency to the level of the other. It is not necessary that the rf level on F1 equal that on F2, but only that the frequency with the lowest level be maximized.

NOTE
If the maximum power output obtainable is less than 12 watts on 10-watt radios or 28 watts on 25-watt radios, go back to Step 2 of the exciter alignment procedure and repeat the alignment a second time. If the maximum obtainable power output is still below 12 or 28 watts, proceed as follows:

IF MAXIMUM IS BETWEEN 12 AND 11 WATTS OR BETWEEN 28 AND 26 WATTS:
Set R140 for 1 uA less than maximum obtainable reading on Meter 5. This ensures that the drive regulator circuit is in operation.

IF MAXIMUM IS LESS THAN 11 WATTS OR 26 WATTS:
The transmitter may be malfunctioning. Refer to the transmitter schematic diagram for troubleshooting information.

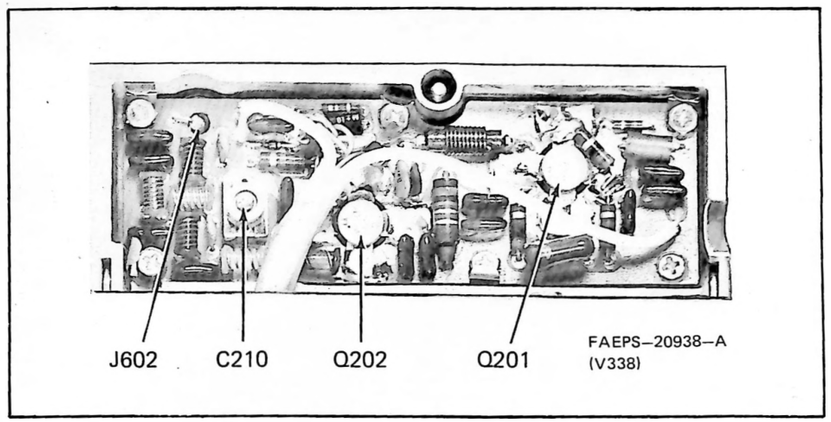


Figure 3. 25-Watt PA Adjustment Locations

OSCILLATOR FREQUENCY ADJUSTMENT

Oscillator should be set on frequency AFTER transmitter has been aligned and BEFORE modulation deviation is set. The frequency should never be checked nor set when the radio is on a metal surface.

NOTE
The transmit frequency of this radio should only be adjusted when the ambinet temperature is 82°F (28°C). Because of temperature and voltage variations between frequency and field locations, the frequency measured may not correspond to the assigned frequency. If the measured frequency is between the limits shown on the graph of Figure 4, make no attempt to correct the frequency. If the measured frequency does not fall within the limits shown on this graph, it is recommended that the radio be returned to a room temperature environment (approximately 82°F, 28°C) and the frequency reset using the procedure described on Sheet 2 of 2 of this Alignment section.

NOTE

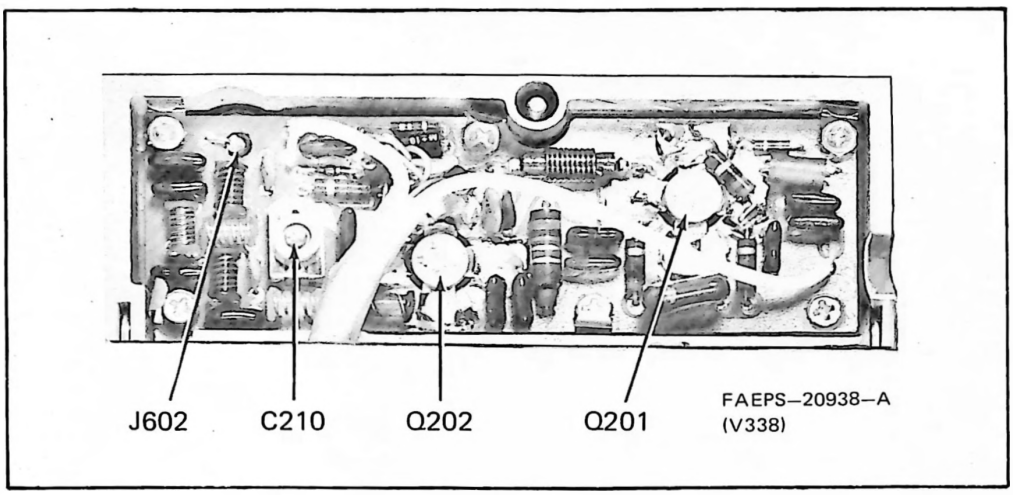
If the maximum power output obtainable is less than 12 watts on 10-watt radios or 28 watts on 25-watt radios, go back to Step 2 of the exciter alignment procedure and repeat the alignment a second time. If the maximum obtainable power output is still below 12 or 28 watts, proceed as follows:

IF MAXIMUM IS BETWEEN 12 AND 11 WATTS OR BETWEEN 28 AND 26 WATTS:

Set R140 for 1 uA less than maximum obtainable reading on Meter 5. This ensures that the drive regulator circuit is in operation.

IF MAXIMUM IS LESS THAN 11 WATTS OR 26 WATTS:

The transmitter may be malfunctioning. Refer to the transmitter schematic diagram for troubleshooting information.



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UNIFIED CHASSIS

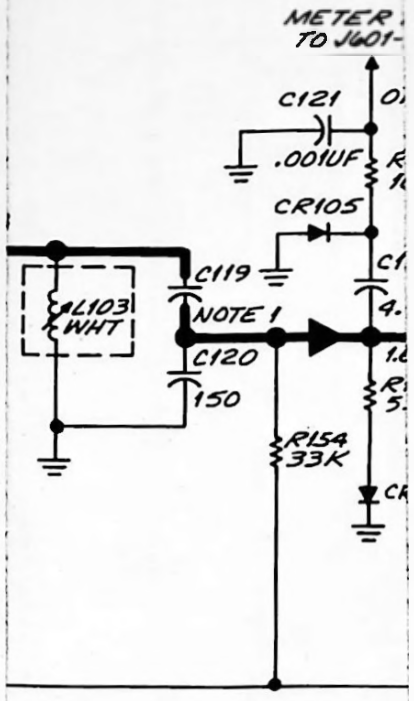
EXCITER SECTION

FUNCTION

Amplifies voice signals from the microphone and produces a low-level FM modulated rf signal for the rf power amplifier.

XTAL TEMPERA
RMS XMTR & RCVR XTALS IF TEMI
MPERATURE. R156,R163,R1, & R2 H
EACH HEATER RESISTOR CONTACTS
DIFFERENTIAL AMPLIFIER WHOSE
PUSH TWEEN Q111 & Q112 BASES. Q112 B
BUT TERMINED BY RT101. DIFFERENTIA
RRENT IN HEATER RESISTORS. Q11

W A+



NNA SWITCH
INPUT DURING TRANSMISSION.
L257–C261 = 1/4 WAVE TRANSMISSION LINE.
UT END.
UNGROUNDED. CR250 NONCONDUCTING (OPEN CIRCUIT). 1/4 WAVE LINE INPUT Z = 50 OHMS.
CUIT IS HIGH IMPEDANCE TO RECEIVED RF. RF PASSES TO RCVR RF INPUT.
(DELAYED PTT IN PL MODELS) GROUNDED. CR250 CONDUCTS (SHORT CIRCUIT). SHORT AT 1/4 WAVE
AUSES "OPEN" AT LINE INPUT. XMTR RF IS BLOCKED FROM RCVR RF INPUT.

EEPS-17205-

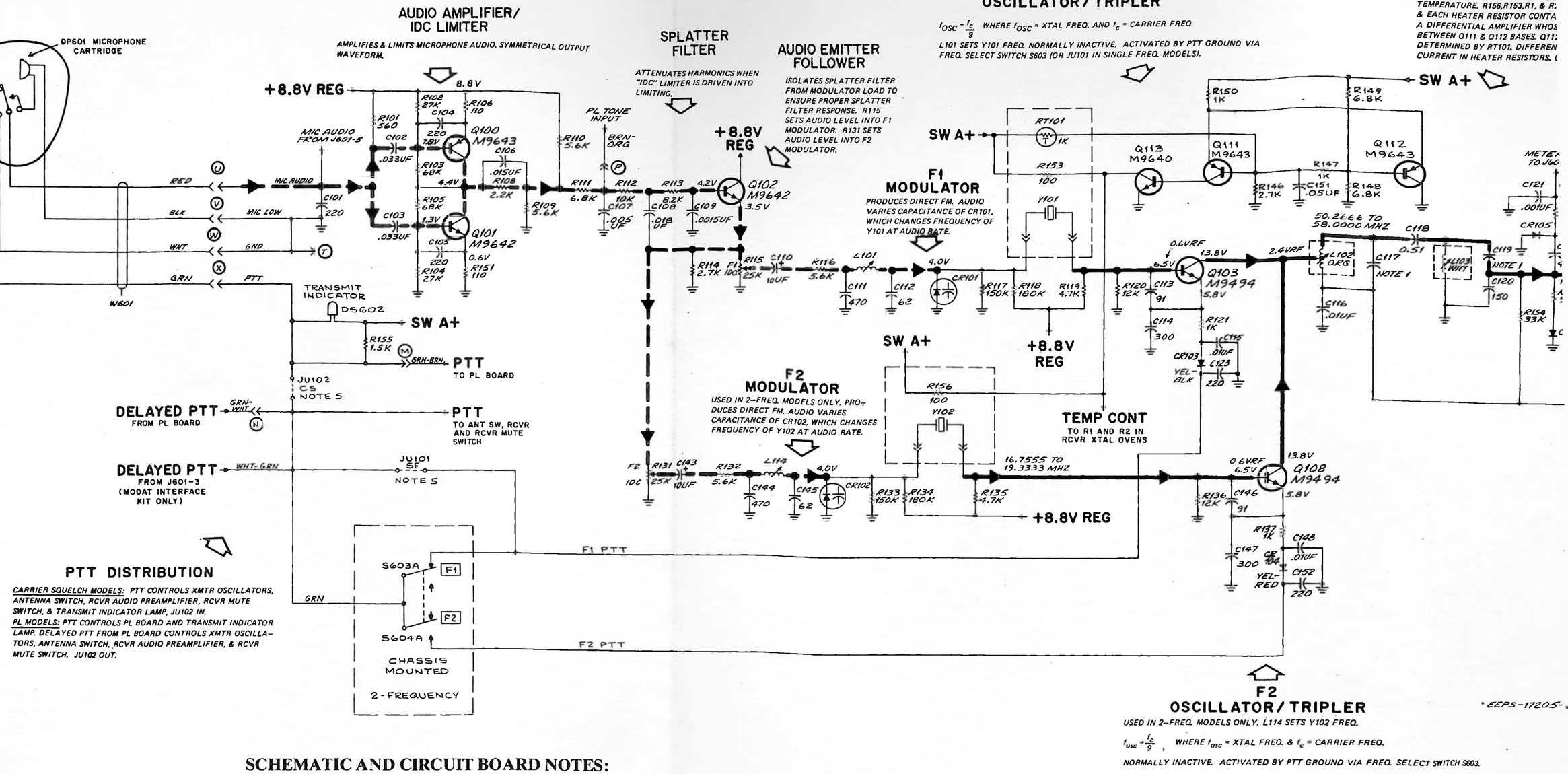
SWITCH S603.

HEORY OF OPERATION DATA

RIMARY RF SIGNAL FLOW

RIMARY AUDIO SIGNAL FLOW

EXCITER/25–WATT POWER AMPLIFIER



SCHEMATIC AND CIRCUIT BOARD NOTES:

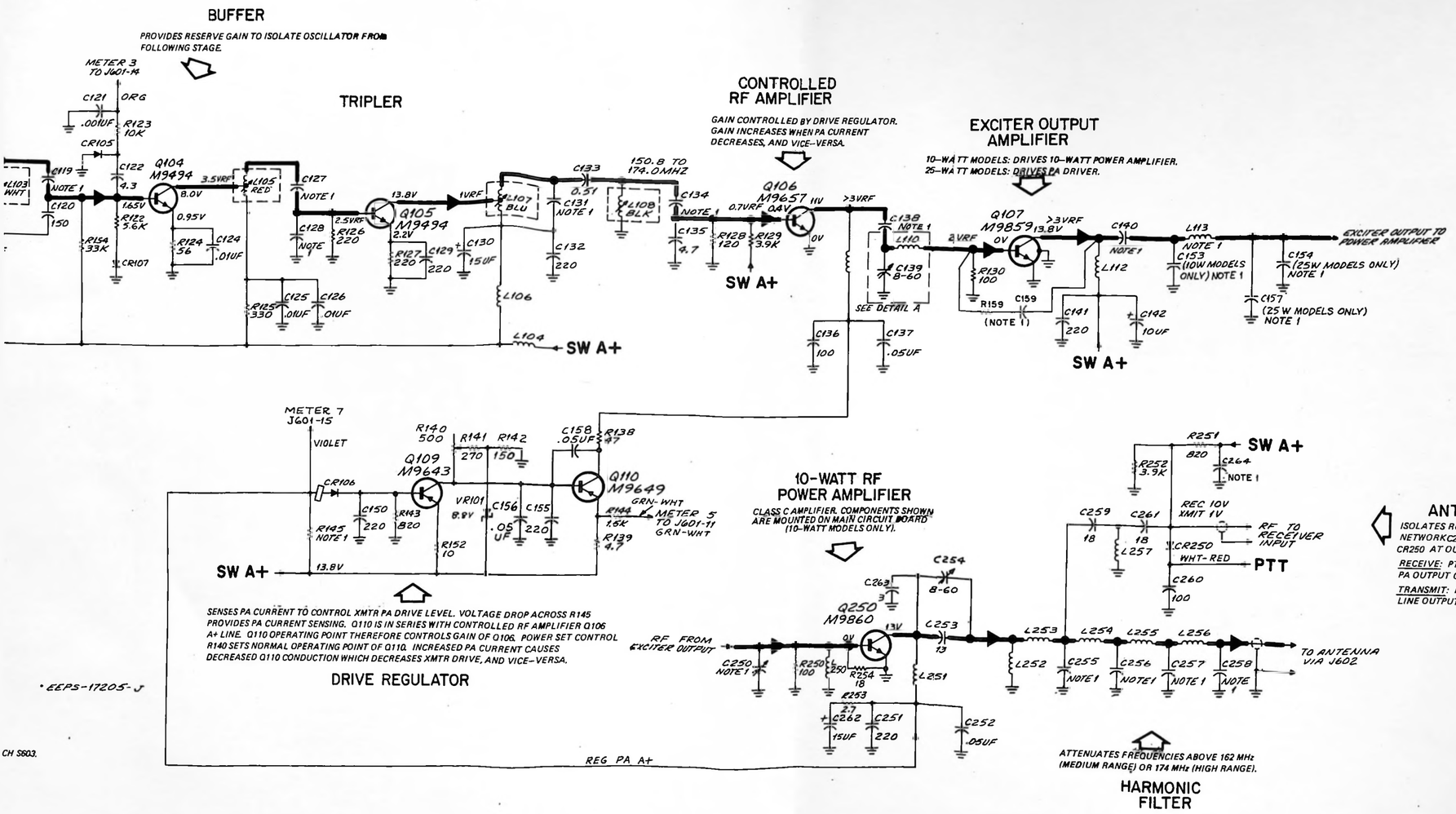
1. Refer to parts list for component value.
2. Unless otherwise noted, resistor values are in ohms, and capacitor values are in picofarads.
3. Voltage notations are as follows:

   T = transmitter keyed
   R = receive (transmitter unkeyed)
   U = receiver unsquelched
   S = receiver fully squelched

4. Unless otherwise noted, dc voltages are measured with a 20,000 ohm-per-volt meter, and rf voltages are measured with an rf voltmeter.
5. Refer to the jumper table for jumper connections used in various radio models, SF = single frequency jumper, CS = carrier squelch jumper.
6. U2 voltages measured with volume control fully counterclockwise (minimum volume).
7. The components enclosed in the heavy dashed outline plus R251, R252, and R253 form the 10-watt power amplifier. In the 10 W parts list, all the parts, except those indicated with a * are omitted for 25-watt models. In addition, C140, C153, C154, C157, C260, L61, L113, and R145 change value or are omitted in 25-watt models as shown in parts list. The 25-watt PA mounts on a separate circuit board and is shown on its own page in this manual.

FUNCTION

Amplifies voice signals from the microphone and produces a low-level FM modulated rf signal for the rf power amplifier.

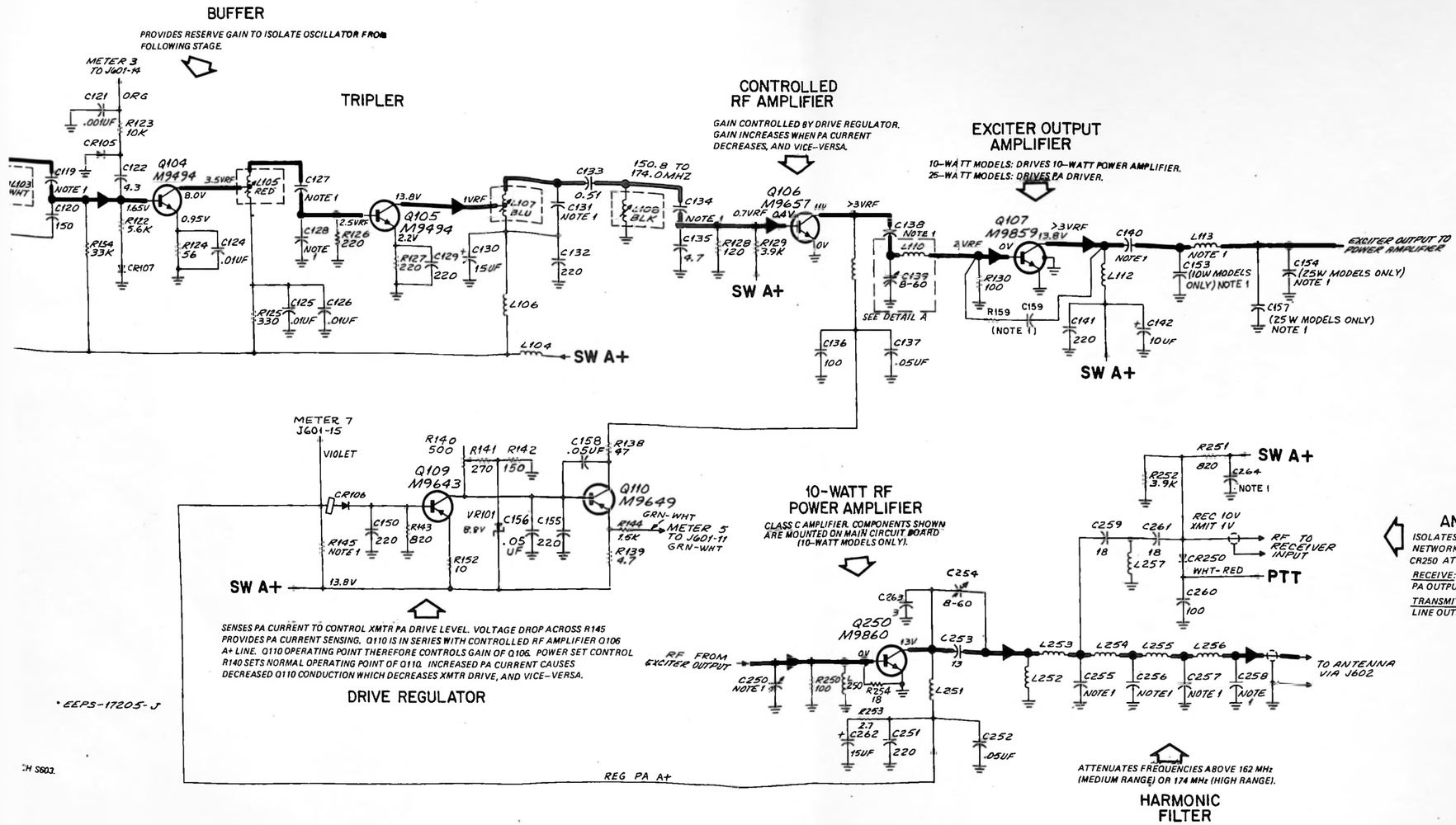

XTAL TEMPERATURE REGULATOR
XMTR & RCVR XTALS IF TEMPERATURE IS BELOW –10°C. RT101 SENSES XTAL RATURE. R156,R153,R1, & R2 HEAT XTALS. RT101 & R153 CONTACT Y101 CASE HEATER RESISTOR CONTACTS ITS RESPECTIVE XTAL CASE. Q111 & Q112 FORM ERENTIAL AMPLIFIER WHOSE OPERATION DEPENDS ON THE VOLTAGE DIFFERENCE EN Q111 & Q112 BASES. Q112 BASE BIAS IS REFERENCE & Q111 BASE BIAS IS MINED BY RT101. DIFFERENTIAL AMPLIFIER CONTROLS Q113, WHICH CONTROLS NT IN HEATER RESISTORS. Q113 IS OFF AT TEMPERATURES ABOVE –10°C.
A+
BUFFER
PROVIDES RESERVE GAIN TO ISOLATE OSCILLATOR FROM FOLLOWING STAGE.
METER 3 TO J601-14
TRIPLER
CONTROLLED RF AMPLIFIER
GAIN CONTROLLED BY DRIVE REGULATOR. GAIN INCREASES WHEN PA CURRENT DECREASES, AND VICE-VERSA.
EXCITER OUTPUT AMPLIFIER
10-WATT MODELS: DRIVES 10-WATT POWER AMPLIFIER.
25-WATT MODELS: DRIVES PA DRIVER.
Q104 M9494
Q105 M9494
Q106 M9657
Q107 M9859
150.8 TO 174.0MHZ
SW A+
EXCITER OUTPUT TO POWER AMPLIFIER
METER 7 J601-15
VIOLET
Q109 M9643
Q110 M9649
GRN-WHT
METER 5 TO J601-11 GRN-WHT
SW A+
13.8V
SENSES PA CURRENT TO CONTROL XMTR PA DRIVE LEVEL. VOLTAGE DROP ACROSS R145 PROVIDES PA CURRENT SENSING. Q110 IS IN SERIES WITH CONTROLLED RF AMPLIFIER Q106 A+ LINE. Q110 OPERATING POINT THEREFORE CONTROLS GAIN OF Q106. POWER SET CONTROL R140 SETS NORMAL OPERATING POINT OF Q110. INCREASED PA CURRENT CAUSES DECREASED Q110 CONDUCTION WHICH DECREASES XMTR DRIVE, AND VICE-VERSA.
DRIVE REGULATOR
10-WATT RF POWER AMPLIFIER
CLASS C AMPLIFIER. COMPONENTS SHOWN ARE MOUNTED ON MAIN CIRCUIT BOARD (10-WATT MODELS ONLY).
Q250 M9860
RF FROM EXCITER OUTPUT
TO ANTENNA VIA J602
REG PA A+
ATTENUATES FREQUENCIES ABOVE 162 MHz (MEDIUM RANGE) OR 174 MHz (HIGH RANGE).
HARMONIC FILTER
ANTENNA SWITCH
ISOLATES RCVR INPUT DURING TRANSMISSION.
NETWORK C259– L257- C261 = 1/4 WAVE TRANSMISSION LINE.
CR250 AT OUTPUT END.
RECEIVE: PTT UNGROUNDED. CR250 NONCONDUCTING (OPEN CIRCUIT). 1/4 WAVE LINE INPUT Z = 50 OHMS. PA OUTPUT CIRCUIT IS HIGH IMPEDANCE TO RECEIVED RF. RF PASSES TO RCVR RF INPUT.
TRANSMIT: PTT (DELAYED PTT IN PL MODELS) GROUNDED. CR250 CONDUCTS (SHORT CIRCUIT). SHORT AT 1/4 WAVE LINE OUTPUT CAUSES "OPEN" AT LINE INPUT. XMTR RF IS BLOCKED FROM RCVR RF INPUT.
PTT
RF TO RECEIVER INPUT
DETAIL "A"
LEGEND
= THEORY OF OPERATION DATA
= PRIMARY RF SIGNAL FLOW
= PRIMARY AUDIO SIGNAL FLOW

* EEPS-17205-J

CH S603.

FUNCTION

Amplifies voice signals from the microphone and produces a low-level FM modulated rf signal for the rf power amplifier.


XTAL TEMPERATURE REGULATOR
XMTR & RCVR XTALS IF TEMPERATURE IS BELOW –10°C. RT101 SENSES XTAL
ATURE. R156,R153,R1, & R2 HEAT XTALS. RT101 & R153 CONTACT Y101 CASE
HEATER RESISTOR CONTACTS ITS RESPECTIVE XTAL CASE. Q111 & Q112 FORM
RENTIAL AMPLIFIER WHOSE OPERATION DEPENDS ON THE VOLTAGE DIFFERENCE
N Q111 & Q112 BASES. Q112 BASE BIAS IS REFERENCE & Q111 BASE BIAS IS
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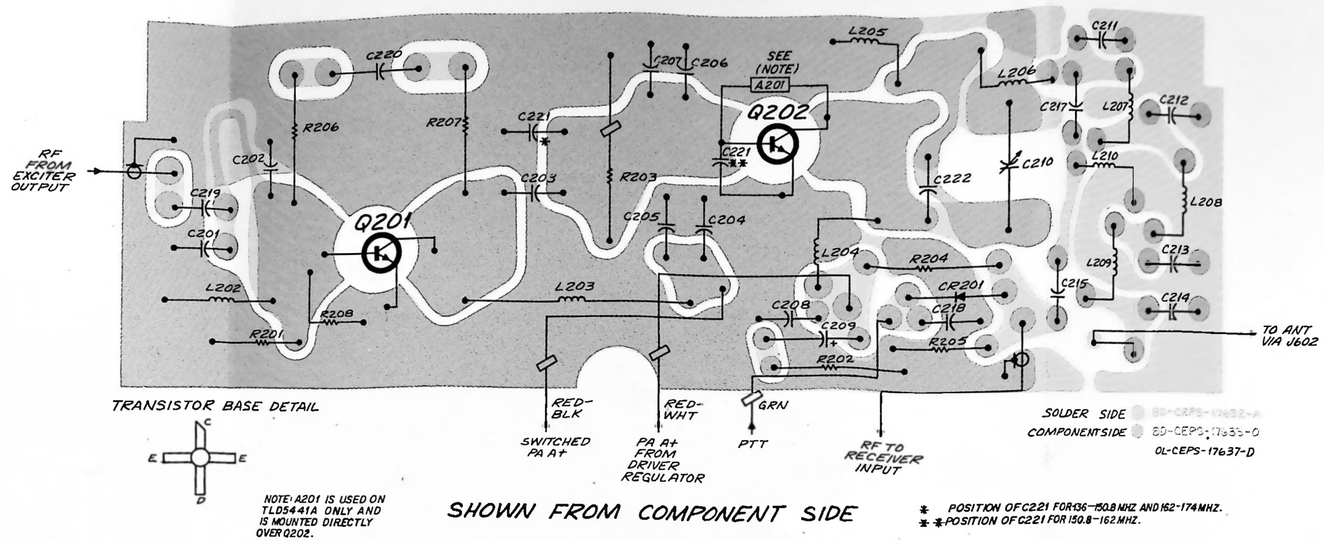
T IN HEATER RESISTORS. Q113 IS OFF AT TEMPERATURES ABOVE –10°C.
A+
BUFFER
PROVIDES RESERVE GAIN TO ISOLATE OSCILLATOR FROM FOLLOWING STAGE.
METER 3 TO J601-14
TRIPLER
CONTROLLED RF AMPLIFIER
GAIN CONTROLLED BY DRIVE REGULATOR. GAIN INCREASES WHEN PA CURRENT DECREASES, AND VICE-VERSA.
EXCITER OUTPUT AMPLIFIER
10-WATT MODELS: DRIVES 10-WATT POWER AMPLIFIER.
25-WATT MODELS: DRIVES PA DRIVER.
Q104 M9494
Q105 M9494
Q106 M9657
Q107 M9859
150.8 TO 174.0MHZ
EXCITER OUTPUT TO POWER AMPLIFIER
SW A+
METER 7 J601-15
VIOLET
Q109 M9643
Q110 M9649
GRN-WHT
METER 5 TO J601-11 GRN-WHT
SENSES PA CURRENT TO CONTROL XMTR PA DRIVE LEVEL. VOLTAGE DROP ACROSS R145 PROVIDES PA CURRENT SENSING. Q110 IS IN SERIES WITH CONTROLLED RF AMPLIFIER Q106 A+ LINE. Q110 OPERATING POINT THEREFORE CONTROLS GAIN OF Q106. POWER SET CONTROL R140 SETS NORMAL OPERATING POINT OF Q110. INCREASED PA CURRENT CAUSES DECREASED Q110 CONDUCTION WHICH DECREASES XMTR DRIVE, AND VICE-VERSA.
DRIVE REGULATOR
10-WATT RF POWER AMPLIFIER
CLASS C AMPLIFIER. COMPONENTS SHOWN ARE MOUNTED ON MAIN CIRCUIT BOARD (10-WATT MODELS ONLY).
Q250 M9860
RF FROM EXCITER OUTPUT
TO ANTENNA VIA J602
ATTENUATES FREQUENCIES ABOVE 162 MHz (MEDIUM RANGE) OR 174 MHz (HIGH RANGE).
HARMONIC FILTER
ANTENNA SWITCH
ISOLATES RCVR INPUT DURING TRANSMISSION.
NETWORK C259–L257–C261 = 1/4 WAVE TRANSMISSION LINE.
CR250 AT OUTPUT END.
RECEIVE: PTT UNGROUNDED. CR250 NONCONDUCTING (OPEN CIRCUIT). 1/4 WAVE LINE INPUT Z = 50 OHMS. PA OUTPUT CIRCUIT IS HIGH IMPEDANCE TO RECEIVED RF. RF PASSES TO RCVR RF INPUT.
TRANSMIT: PTT (DELAYED PTT IN PL MODELS) GROUNDED. CR250 CONDUCTS (SHORT CIRCUIT). SHORT AT 1/4 WAVE LINE OUTPUT CAUSES "OPEN" AT LINE INPUT. XMTR RF IS BLOCKED FROM RCVR RF INPUT.
RF TO RECEIVER INPUT
PTT
REG PA A+
DETAIL "A"
25-WATT 150.8-162 MHz MODELS ONLY
LEGEND
= THEORY OF OPERATION DATA
= PRIMARY RF SIGNAL FLOW
= PRIMARY AUDIO SIGNAL FLOW

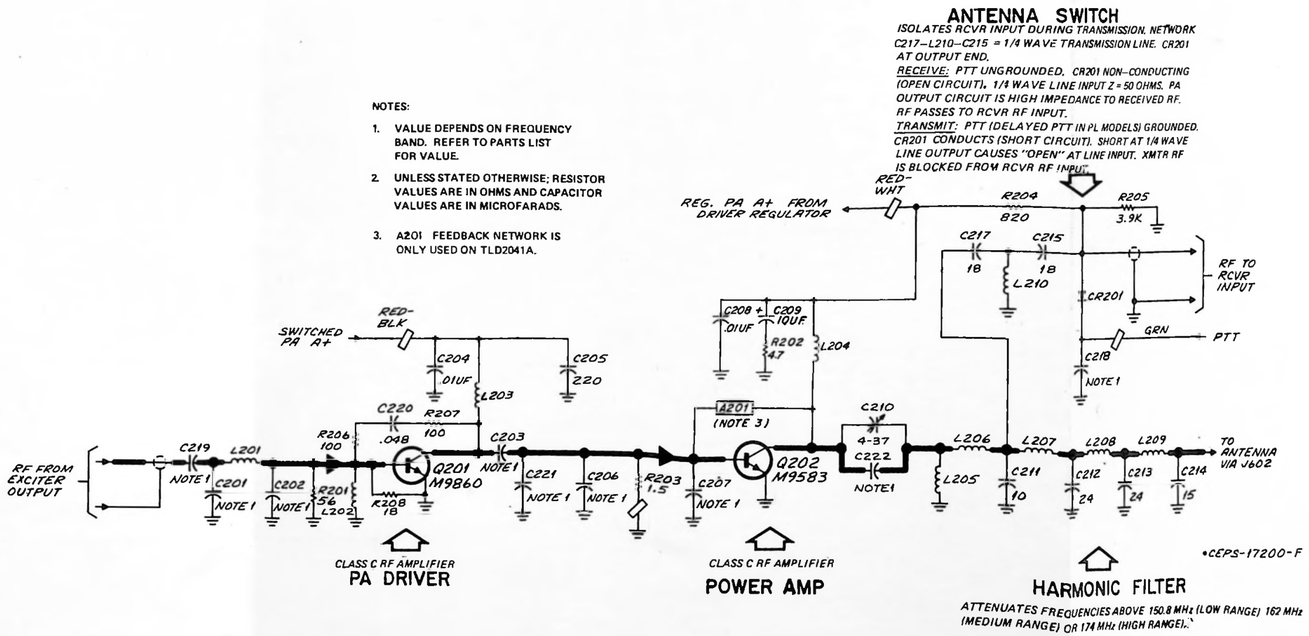
25-WATT POWER AMPLIFIER, HARMONIC FILTER, AND ANTENNA SWITCH

MODELS TLD2042A (150.8-162 MHz)
TLD2043A (162-174 MHz)

FUNCTION

Provides 25 watts of rf power output.





REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION

LEGEND
L = 136-150.8 MHz
M = 150.8-162 MHz
H = 162-174 MHz

TLD2041A Power Amplifier (136-150.8 MHz)
TLD2042A Power Amplifier (150.8-162 MHz)
TLD2043A Power Amplifier (162-174 MHz) PL-3360-J

		FEEDBACK, assembly:
A201L	1-80739B40	RC Network (Hybrid)
		CAPACITOR, fixed: pF ±5%:
		500-V: unless otherwise stated
C201L, M	21-868822	51 ±3%
C201H	21-84494B28	43
C202	21-84494B34	68
C203L	21-84494B07	150
C203M	21-84494B31	75
C203H	21-84494B27	140 ±3%
C204, 208	21-832501	.01 uF +60-40%; 250 V
C205	21-83596E10	220 ±20%
C206L, M, 207H	21-84494B34	68
C206H	21-84494B02	62
C207L	21-84494B31	75
C207M	21-84494B31	75
C209	23-84762H03	10 uF; 20 V
C210	20-84579B03	variable; 4-37.5 pF
C211	21-84494B29	10 ±2%; 300 V
C212, 213	21-83406D56	24
C214	21-84494B38	15
C215L, 217L	21-82204B58	20
C215M, H, 217M, H	21-83406D79	18
C216		NOT USED
C218L, M	21-84494B04	100
C218H	21-865941	90 ±2%; 300 V
C219L	21-82204B	
C219M	21-868822	51 ±3%
C219H	21-84494B24	39
C220	8-82905G03	.047 uF ±10%; 50 V
C221L	21-84494B34	68
C221M	21-84494B34	68
C221H	21-868822	51 ±3%
C222L	21-83406D56	24
C222M, H	21-83406D97	15
		DIODE: (SEE NOTE)
CR201	48-83510F04	Pin
		COIL:
L201		part of printed circuit board plating
L202	24-83977B01	Choke
L203L	24-824998	153 nH
L203M, H	24-84346A02	230 nH
L204	24-84614A03	2-1/2 turns
L205	24-84614A05	1-1/2 turns
L206	24-83884G04	7-1/2 turns
L207H	24-83884G08	5-1/2 turns
L207L, M, 208H	24-83884G09	6-1/2 turns
L208L, M	24-83884G04	7-1/2 turns
L209L, M	24-83884G09	6-1/2 turns
L210L	24-83884G09	6-1/2 turns
L210M, H, 209H	24-83884G08	5-1/2 turns
		TRANSISTOR: (SEE NOTE)
Q201	48-869860	NPN; type M9860
Q202	48-869583	NPN; type M9583
		RESISTOR, fixed: ±10%; 1/2 W unless otherwise stated
R201	6-124C19	56; 1/4 W
R202	6-124B61	4.7; 1/4 W
R203	17-82036G07	1.5; 1 W
R204	6-125C47	820
R205	6-124C63	3.9k; 1/4 W
R206, 207	6-125C25	100
R208	6-125C07	18
	NON-REFERENCED ITEM	
	26-82320L03	HEATSINK

NOTE:
For optimum performance, replacement diodes and transistors must be ordered by Motorola part number.

Oscill
The f

25-WATT POWER AMPLIFIER, HARMONIC FILTER, AND ANTENNA SWITCH

MODELS TLD2042A (150.8-162 MHz)
TLD2043A (162-174 MHz)

FUNCTION

Provides 25 watts of rf power output.

Oscill
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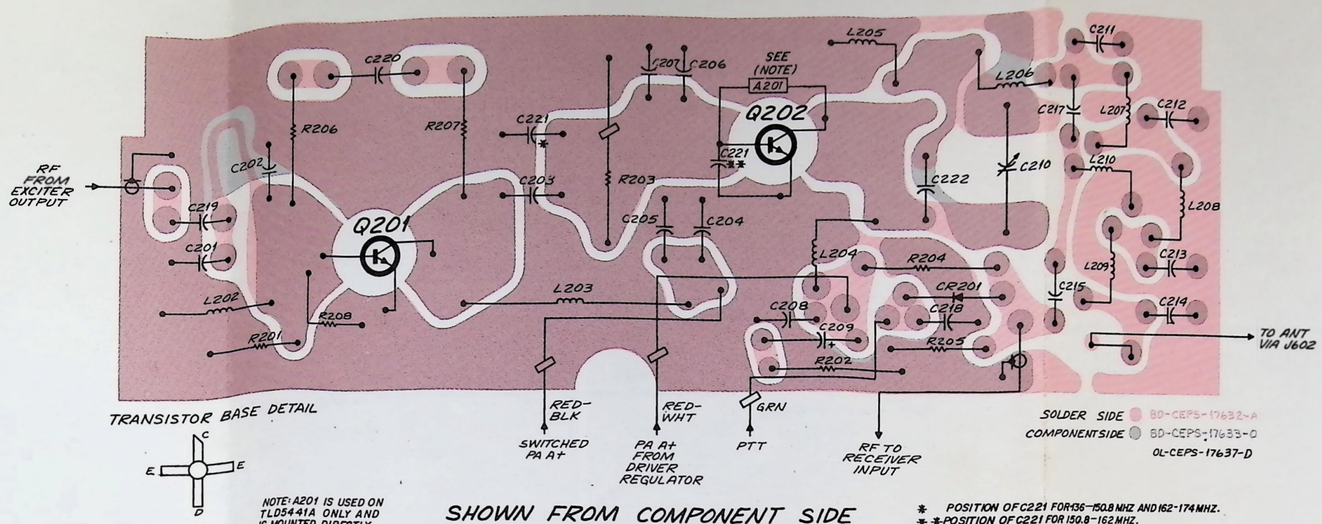
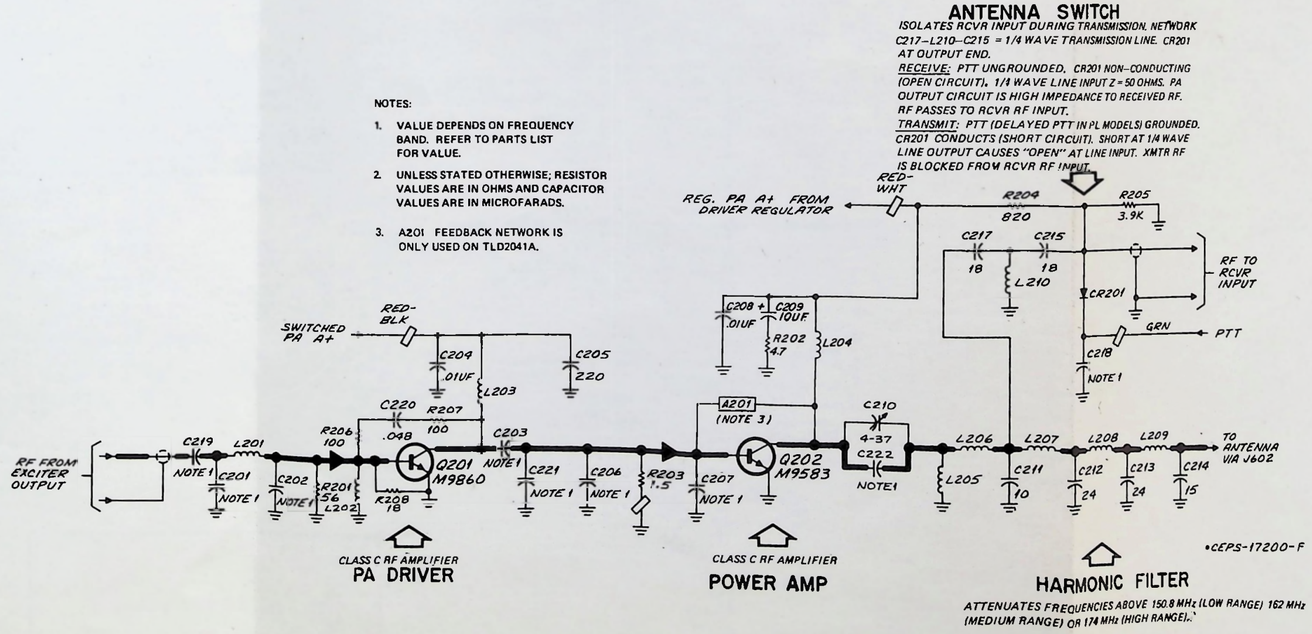
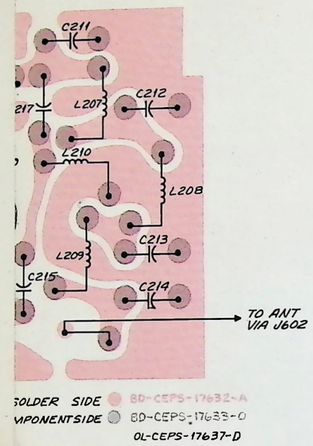




68P81031E38-F
2/1/81-PHI

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		LEGEND L = 136-150.8 MHz M = 150.8-162 MHz H = 162-174 MHz
		TLD2041A Power Amplifier (136-150.8 MHz) TLD2042A Power Amplifier (150.8-162 MHz) TLD2043A Power Amplifier (162-174 MHz) PL-3360-J
		FEEDBACK, assembly:
A201L	1-80739B40	RC Network (Hybrid)
		CAPACITOR, fixed: pF ±5%; 500-V: unless otherwise stated
C201L, M	21-868822	51 ±3%
C201H	21-84494B28	43
C202	21-84494B34	68
C203L	21-84494B07	150
C203M	21-84494B31	75
C203H	21-84494B27	140 ±3%
C204, 208	21-832501	.01 uF +60-40%; 250 V
C205	21-83596E10	220 ±20%
C206L, M, 207H	21-84494B34	68
C206H	21-84494B02	62
C207L	21-84494B31	75
C207M	21-84494B31	75
C209	23-84762H03	10 uF; 20 V
C210	20-84579B03	variable; 4-37.5 pF
C211	21-84494B29	10 ±2%; 300 V
C212, 213	21-83406D56	24
C214	21-84494B38	15
C215L, 217L	21-82204B58	20
C215M, H, 217M, H	21-83406D79	18
C216		NOT USED
C218L, M	21-84494B04	100
C218H	21-865941	90 ±2%; 300 V
C219L	21-82204B	
C219M	21-868822	51 ±3%
C219H	21-84494B24	39
C220	8-82905G03	.047 uF ±10%; 50 V
C221L	21-84494B34	68
C221M	21-84494B34	68
C221H	21-868822	51 ±3%
C222L	21-83406D56	24
C222M, H	21-83406D97	15
		DIODE: (SEE NOTE)
CR201	48-83510F04	Pin
		COIL:
L201		part of printed circuit board plating
L202	24-83977B01	Choke
L203L	24-824998	153 nH
L203M, H	24-84346A02	230 nH
L204	24-84614A03	2-1/2 turns
L205	24-84614A05	1-1/2 turns
L206	24-83884G04	7-1/2 turns
L207H	24-83884G08	5-1/2 turns
L207L, M, 208H	24-83884G09	6-1/2 turns
L208L, M	24-83884G04	7-1/2 turns
L209L, M	24-83884G09	6-1/2 turns
L210L	24-83884G09	6-1/2 turns
L210M, H, 209H	24-83884G08	5-1/2 turns
		TRANSISTOR: (SEE NOTE)
Q201	48-869860	NPN; type M9860
Q202	48-869583	NPN; type M9583
		RESISTOR, fixed: ±10%; 1/2 W unless otherwise stated
R201	6-124C19	56; 1/4 W
R202	6-124B61	4.7; 1/4 W
R203	17-82036G07	1.5; 1 W
R204	6-125C47	820
R205	6-124C63	3.9k; 1/4 W
R206, 207	6-125C25	100
R208	6-125C07	18
	NON-REFERENCED ITEM	
	26-82320L03	HEATSINK

NOTE:
For optimum performance, replacement diodes and transistors must be ordered by Motorola part numbers.



I FOR 136–150.8 MHZ AND 162–174 MHZ.
FOR 150.8–162 MHZ.

WITCH
TRANSMISSION NETWORK
TRANSMISSION LINE. CR201

CR201 NON-CONDUCTING
INPUT Z = 50 OHMS. PA
IANCE TO RECEIVED RF.

IN PL MODELS) GROUNDED.
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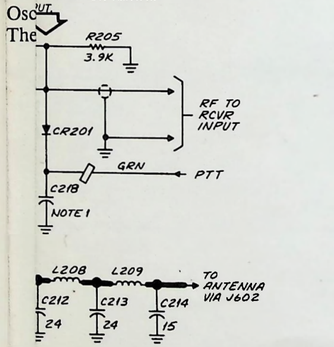


*CEPS-17200-F

MONIC FILTER
QUENCIES ABOVE 150.8 MHz (LOW RANGE) 162 MHz
OR 174 MHz (HIGH RANGE).

SYMBOL	PART NO.	

LEGEND
L = 136-150.8 MHz
M = 150.8-162 MHz
H = 162-174 MHz

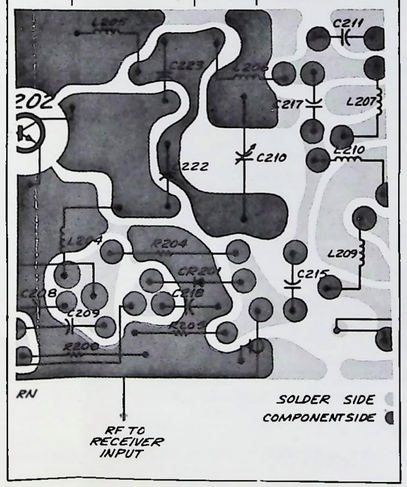
TLD2041A Power Amplifier (136-150.8 MHz)
TLD2042A Power Amplifier (150.8-162 MHz)
TLD2043A Power Amplifier (162-174 MHz) PL-3360-J

A201L	1-80739B40	FEEDBACK, assembly: RC Network (Hybrid)
		CAPACITOR, fixed: pF ±5%; 500-V: unless otherwise stated
C201L, M	21-868822	51 ±3%
C201H	21-84494B28	43
C202	21-84494B34	68
C203L	21-84494B07	150
C203M	21-84494B31	75
C203H	21-84494B27	140 ±3%
C204, 208	21-832501	.01 uF +60-40%; 250 V
C205	21-83596E10	220 ±20%
C206L, M, 207H	21-84494B34	68
C206H	21-84494B02	62
C207L	21-84494B31	75
C207M	21-84494B31	75
C209	23-84762H03	10 uF; 20 V
C210	20-84579B03	variable; 4-37.5 pF
C211	21-84494B29	10 ±2%; 300 V
C212, 213	21-83406D56	24
C214	21-84494B38	15
C215L, 217L	21-82204B58	20
C215M, H, 217M, H	21-83406D79	18
C216		NOT USED
C218L, M	21-84494B04	100
C218H	21-865941	90 ±2%; 300 V
C219L	21-82204B	
C219M	21-868822	51 ±3%
C219H	21-84494B24	39
C220	8-82905G03	.047 uF ±10%; 50 V
C221L	21-84494B34	68
C221M	21-84494B34	68
C221H	21-868822	51 ±3%
C222L	21-83406D56	24
C222M, H	21-83406D97	15
		DIODE: (SEE NOTE)
CR201	48-83510F04	Pin
		COIL:
L201		part of printed circuit board plating
L202	24-83977B01	Choke
L203L	24-824998	153 nH
L203M, H	24-84346A02	230 nH
L204	24-84614A03	2-1/2 turns
L205	24-84614A05	1-1/2 turns
L206	24-83884G04	7-1/2 turns
L207H	24-83884G08	5-1/2 turns
L207L, M, 208H	24-83884G09	6-1/2 turns
L208L, M	24-83884G04	7-1/2 turns
L209L, M	24-83884G09	6-1/2 turns
L210L	24-83884G09	6-1/2 turns
L210M, H, 209H	24-83884G08	5-1/2 turns
		TRANSISTOR: (SEE NOTE)
Q201	48-869860	NPN; type M9860
Q202	48-869583	NPN; type M9583
		RESISTOR, fixed: ±10%; 1/2 W unless otherwise stated
R201	6-124C19	56; 1/4 W
R202	6-124B61	4.7; 1/4 W
R203	17-82036G07	1.5; 1 W
R204	6-125C47	820
R205	6-124C63	3.9k; 1/4 W
R206, 207	6-125C25	100
R208	6-125C07	18
NON-REFERENCED ITEM		
	26-82320L03	HEATSINK

NOTE:
For optimum performance, replacement diodes and transistors must be ordered by Motorola part number.

REVISIONS 68P81031E38-C

	BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE
	TLD2042A TLD2043A	C201M	FROM 21-84494B25, 49 pF TO 21-868822, 51 pF
		C201H	FROM 21-84494B24, 39 pF TO 21-84494B28, 43 pF
		C219M	FROM 21-84494B01, 51 pF TO 21-868822, 51 pF
		C219H	FROM 21-840712, 36 pF TO 21-84494B24, 39 pF
		C221M	FROM 21-84494B28, 43 pF TO 21-84494B34, 68 pF
		C221H	FROM 21-852322, 62 pF TO 21-868822, 51 pF
		C222	FROM 21-84494B41, 24 pF TO 21-84494B38, 15 pF
		C222H	REMOVED 21-848272, 21 pF
		C223	REMOVED 21-84494B41, 24 pF
		L205	FROM 24-83884G03 TO 24-84614A05
		L206	FROM 24-83884G06 TO 24-83884G04
			PRINTED CIRCUIT BOARD REVISED, CIRCUIT WAS AS FOLLOWS:



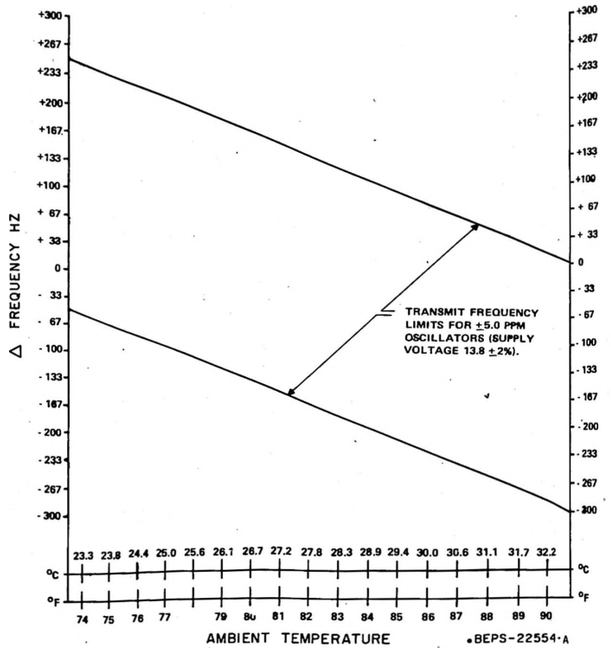


Figure 4. Acceptable Limits for Field Frequency Measurements

1. Set up the frequency meter or counter controls as required.

2. In *Private-Line* (PL) squelch radios, remove the *Vibrasponder* resonant reed from its socket on the PL board. In *Digital Private-Line* (DPL) squelch radios, disable the DPL encoder by shorting together the "code disable" plating pads on the DPL board.

FREQUENCY ADJUSTMENT PROCEDURE

Step	Procedure
1	Select F1.
2	Key transmitter with no modulation.
3	Adjust L101 for F1 frequency ± 100 Hz.
	Two-Frequency Models Only
4	Select F2.
5	Adjust L114 for F2 frequency ± 100 Hz.

IDC ADJUSTMENT

NOTE

Oscillator frequency adjustment must be made BEFORE setting IDC controls.

1. Set the deviation meter operating controls as needed.

2. In PL squelch radios, remove the *Vibrasponder* resonant reed from its socket on the PL board. In DPL squelch radios, disable the DPL encoder by shorting together the "code disable" plating pads on the DPL board.

3. Connect the output of an audio signal generator to J601 as follows:

   High side through a 1 uF capacitor (+ end toward the radio) to J601-5.
   Low side to J601-6 or radio chassis.

NOTE

The transmitter must be keyed by pressing the KEY button on the test set or by shorting J601-8 to J601-6 or the radio chassis. DO NOT USE THE MICROPHONE PTT SWITCH TO KEY THE TRANSMITTER DURING IDC ADJUSTMENT.

4. Connect an ac voltmeter across the audio signal generator output.

IDC ADJUSTMENT PROCEDURE

Step	Procedure
1	Set audio signal generator output frequency to 1000 Hz and output level to 0.8 V.
2	Select F1 and key transmitter. Adjust F1 "IDC" control R115 for ± 5 kHz deviation meter reading.
3	On 2-Freq. models, select F2 and key transmitter. Adjust F2 "IDC" control R131 for ± 5 kHz deviation meter reading.
4	Reduce audio signal generator output level until deviation meter reads ±3.0 kHz. Audio oscillator output level should be 165 mV ± 3 dB.
	Private-Line Models Only
5	Insert resonant reed into socket on PL board and disconnect audio oscillator from J601.
6	Key transmitter and adjust tone level control R433 for PL tone deviation reading of 800 Hz.
7	Reconnect audio signal generator to J601-5 and -6 and repeat Steps 1 through 3. Be sure overall deviation does not exceed ± 5 kHz, including PL tone.
	—or—
	Digital Private-Line Models Only (see Note)
5	Remove the short from between the "code disable" plating pads on the DPL board and disconnect the audio signal generator from J601.
6	Key the transmitter and adjust Code Level set control R342 for a DPL code deviation reading of 900 Hz.
7	Reconnect the audio signal generator to J601-5 and -6. Repeat Steps 5 and 6. Be sure overall deviation does not exceed ± 5 kHz, including DPL code.

NOTE

To obtain accurate measurement of transmitter deviation in radios equipped with "Digital Private-Line" binary-coded squelch, the frequency response of the deviation measuring equipment must be less than 1 Hz. If a deviation meter with this low frequency response characteristic is not available, the transmitter deviation can be checked by making the transmitter send continuous turn-off code during the measurement. Since the turn-off code waveform is sinusoidal, standard test equipment will then provide an accurate deviation measurement. To make the transmitter send continuous turn-off code, short together the base and emitter plating of PTT inverter Q309 and key the transmitter.

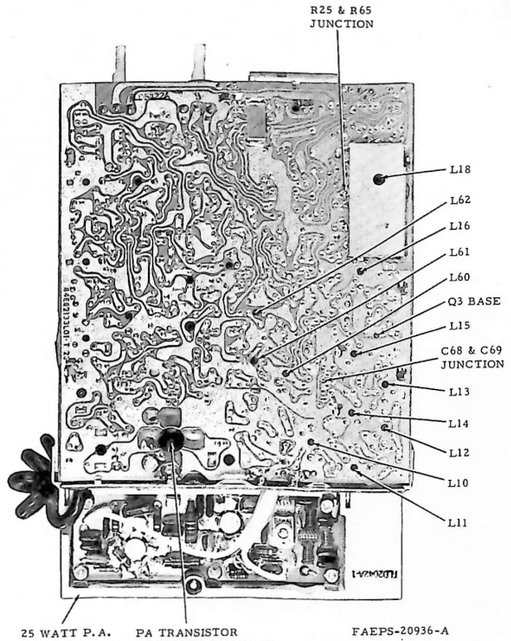


Figure 1. Receiver Adjustment Location Detail

RECEIVER METERING

Table 1.
Typical Receiver Meter Readings With TEK-5 Metering Panel or S1056-59 Portable Test Set

Meter	Measurement	Reading (uA)
1	2nd I-F Amplifier Signal Level	8-14 (No Signal) 50 (40 uV Input)
2	Quadrature Detector Output	24 ± 1

Table 2. Receiver Meter Readings With 20,000 Ohm/Volt VOM

Metering Function	VOM Connections +	VOM Connections —	VOM Scale	Typical Reading
M1 2nd I-F Ampl. Signal Level	J601-10	Chassis Ground	2.5 V dc	.25-.5 V (No Signal) 1.75 V (40 uV Input)
M2 Quadrature Detector Output	J601-13	Chassis Ground	10 V dc	5.3 V ± .2 V (AC-DC VOM) 5.5 V (using DC Multimeter)

PREALIGNMENT NOTES

1. On *Digital Private-Line* squelch and *Private-Line* squelch radio sets, disable the DPL or PL decoder by removing the microphone from the hangup box or by depressing the front panel MONITOR pushbutton.

2. In some cases, peak meter readings may occur at two points in the tuning range of a coil. Always choose point where the slug is nearest the top of the coil form (away from the circuit board).

3. Unnecessary tuning adjustments should be avoided. Usually, the receiver requires only a "touch-up" alignment. If so, proceed to Step 5 of the alignment procedure. Complete receiver alignment is necessary in the following cases:

   a. After changing the receiver operating frequency.
   b. After replacing a component in a frequency-sensitive network.

4. Before beginning a complete receiver alignment, preset tuning adjustments as follows:

   a. Set L10, 11, 12 and 13 according to the Prealignment Tuning Chart shown in Figure 2.
   b. Set L14, 15, and 16 slugs 7-1/2 turns in from tops of coil forms.
   c. Set L18 slug 5 turns from in top of coil forms.

5. Receiver frequency calculations:

   $$f_{osc} = \frac{f_c - 10.7\ MHz}{3}$$

   $f_{inj} = 3\ f_{osc} = f_c - 10.7$ MHz;

   Where: f_c = carrier frequency, f_{osc} = oscillator crystal frequency, and f_{inj} = mixer injection frequency

6. Two-frequency radios should be tuned on the highest operating frequency.

7. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable. The metering adapter cables and directions for their use are shown in metering adapter cable diagram in test equipment section. Metering may be accomplished with a 20,000 ohm-per-volt voltmeter if a test set or metering panel is not available. Refer to Tables 1 and 2 on this page. Voltage readings with a VOM are not accurate if metering panel or test set is connected simultaneously.

8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.8 volts.

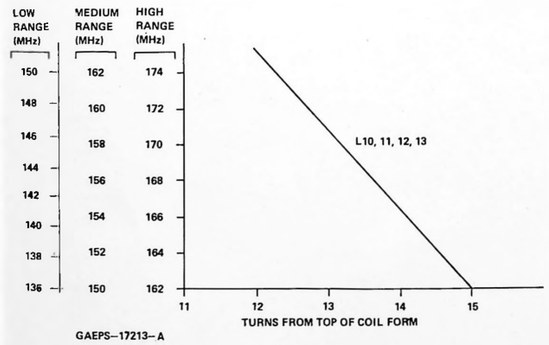


Figure 2. Prealignment Tuning Chart

RECEIVER A

Step	Input Signal	Signal Input Point
1. Quadrature Detector	10.7 MHz @ 1 mV	Near Q3. Allow signal to "spray" into circuit. (Note 4)
2. I-F Strip	10.7 MHz (Note 1)	Antenna Connector
3. Injection Oscillator Frequency	Carrier Frequency	Antenna connector
	and simultaneously	
	10.7 MHz	Loosely coupled to rf amplifier
4. RF Amplifier and I-F Strip	Carrier Frequency (Notes 1 & 2)	Antenna Connector
5. Mixer Input and Injection Oscillator Output	Carrier frequency. Level set to where receiver begins to quiet.	Antenna Connector

NOTES:
1. Reduce signal generator output as needed to keep M1 read
2. To set signal generator on frequency, either use a counte Do not use meter 2 to set frequency.
3. Voltage readings with a voltmeter will not be accurate if m
4. With a wire connected to a 10.7 MHz signal source outp Q3) but do not allow the wire to make physical contact wi

20 DB QUIETING SENSI

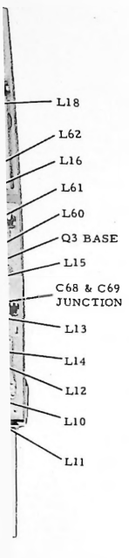
NO

This sensitivity measurement shoul

1. Connect an ac voltmeter across the speaker.
2. On PL model radio sets, disable PL by depressing the MO microphone from the hangup box.
3. Turn the SQUELCH control fully counterclockwise.
4. Turn on the radio set and adjust the VOLUME control ur
5. Connect an rf signal generator to the radio set antenna c set the generator output level control to minimum.
6. Slowly increase the output level of the rf signal generator
7. Note the signal generator output signal level. This signal not be greater than the level listed in the specification tabl

RECEIVER WIDH

On two frequency radios, tune up radio at highest frequency. ing L12.



Detail

PREALIGNMENT NOTES

1. On *Digital Private-Line* squelch and *Private-Line* squelch radio sets, disable the DPL or PL decoder by removing the microphone from the hangup box or by depressing the front panel MONITOR pushbutton.

2. In some cases, peak meter readings may occur at two points in the tuning range of a coil. Always choose point where the slug is nearest the top of the coil form (away from the circuit board).

3. Unnecessary tuning adjustments should be avoided. Usually, the receiver requires only a "touch-up" alignment. If so, proceed to Step 5 of the alignment procedure. Complete receiver alignment is necessary in the following cases:

   a. After changing the receiver operating frequency.
   b. After replacing a component in a frequency-sensitive network.

4. Before beginning a complete receiver alignment, preset tuning adjustments as follows:

   a. Set L10, 11, 12 and 13 according to the Prealignment Tuning Chart shown in Figure 2.
   b. Set L14, 15, and 16 slugs 7-1/2 turns in from tops of coil forms.
   c. Set L18 slug 5 turns from in top of coil forms.

5. Receiver frequency calculations:

$$f_{osc} = \frac{f_c - 10.7\ MHz}{3}$$

$f_{inj} = 3\ f_{osc} = f_c - 10.7$ MHz;

Where: f_c = carrier frequency, f_{osc} = oscillator crystal frequency, and f_{inj} = mixer injection frequency

6. Two-frequency radios should be tuned on the highest operating frequency.

7. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable. The metering adapter cables and directions for their use are shown in metering adapter cable diagram in test equipment section. Metering may be accomplished with a 20,000 ohm-per-volt voltmeter if a test set or metering panel is not available. Refer to Tables 1 and 2 on this page. Voltage readings with a VOM are not accurate if metering panel or test set is connected simultaneously.

8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.8 volts.

EK-5
t Set

eading (uA)
4 (No Signal) '40 uV Input)
24 ± 1

n/Volt VOM

Typical Reading
.25-.5 V (No Signal) 1.75 V (40 uV Input)
5.3 V ± .2 V (AC-DC VOM) 5.5 V (using DC Multimeter)

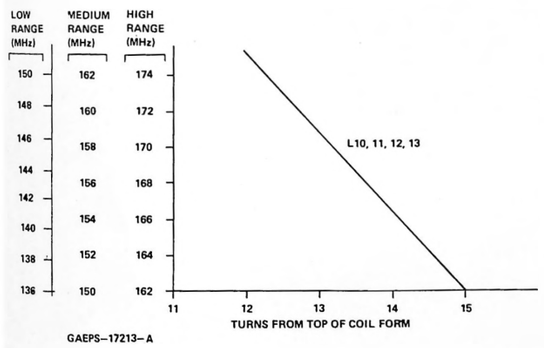


Figure 2. Prealignment Tuning Chart

RECEIVER ALIGNMENT

Step	Input Signal	Signal Input Point	Adjust	Metering Point	Desired Reading
1. Quadrature Detector	10.7 MHz @ 1 mV	Near Q3. Allow signal to "spray" into circuit. (Note 4)	L18	M2	24 ± 1 mA
				—OR—	
				VTVM or DVM at J601-13	5.8 V dc (Note 3)
2. I-F Strip	10.7 MHz (Note 1)	Antenna Connector	L14, 15, 16	M1	Peak, then repeak.
3. Injection Oscillator Frequency			L61 (F1), then L62 (F2)	Frequency Counter through .01 uF capacitor to C68-C69 junction.	3 x crystal frequency. Recheck both coil settings.
			—OR—		
	Carrier Frequency *and simultaneously* 10.7 MHz	Antenna connector Loosely coupled to rf amplifier	L61 (F1) and L62 (F2)	Radio speaker	Signal levels to provide beat note, then L61 (and L62 in 2-freq. models) for zero beat. Re-check both coil settings.
4. RF Amplifier and I-F Strip	Carrier Frequency (Notes 1 & 2)	Antenna Connector	L13, 12, 11, 10, 60 then L14, 15, 16	M1	Peak, then repeak.
5. Mixer Input and Injection Oscillator Output	Carrier frequency. Level set to where receiver begins to quiet.	Antenna Connector	L60, 13, 12, 11, 10		Best receiver quieting. (Recheck injection oscillator frequency and readjust if necessary.)

NOTES:
1. Reduce signal generator output as needed to keep M1 reading below 40 uA.
2. To set signal generator on frequency, either use a counter on the generator output or use the zero beat method (Step 5). Do not use meter 2 to set frequency.
3. Voltage readings with a voltmeter will not be accurate if metering panel or test set is connected simultaneously.
4. With a wire connected to a 10.7 MHz signal source output, "spray" the signal near Q3 (that is, place the wire close to Q3) but do not allow the wire to make physical contact with any part of the circuit.

20 DB QUIETING SENSITIVITY MEASUREMENT

NOTE
This sensitivity measurement should be made after receiver alignment.

1. Connect an ac voltmeter across the speaker.
2. On PL model radio sets, disable PL by depressing the MONITOR button on the radio set front panel or by removing the microphone from the hangup box.
3. Turn the SQUELCH control fully counterclockwise.
4. Turn on the radio set and adjust the VOLUME control until a reading of 2 volts is obtained on the ac voltmeter.
5. Connect an rf signal generator to the radio set antenna connector. Set the signal generator to the carrier frequency, and set the generator output level control to minimum.
6. Slowly increase the output level of the rf signal generator until the ac voltmeter reads 0.2 volts.
7. Note the signal generator output signal level. This signal level is the 20 dB quieting sensitivity of the receiver and should not be greater than the level listed in the specification tables at the front of this manual.

RECEIVER WIDE-SPACE TUNING

On two frequency radios, tune up radio at highest frequency. Switch to lowest frequency and balance 20 dB quieting by retuning L12.

parts list

TKN6948A Power Cable Kit — PL-6084-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge:
F602	65-86099	7.5 amp; 32 V; type 3AG; fast-blow
		connector, plug:
P601		Includes:
	15-83293K01	INSULATOR, connector; 15-circuit
	29-84706E05	TERMINAL, pin; male; 4 used
	30-10286A21	WIRE, jumper; BLK
P602		Includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power:
W601	30-84396L01	2-conductor; (18 ga.); 120" used
		fuseholder, in-line:
XF602		Includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-134371	TUBING, heatsink (BLK) 1" length; 2 used

TKN6949A Power Cable Kit — PL-6085-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge:
F603	65-4165	15 amp; 35 V; fast-blow type
		connector, plug:
P601		Includes:
	15-83958L01	INSULATOR, connector; 17-circuit
	29-84706E05	TERMINAL, pin; male; (large) 2 used
	29-82335A01	TERMINAL, pin; male; (small) 6 used
	30-10286A21	WIRE, jumper; BLK
P602		Includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power:
W601	30-84396L02	2-conductor; (14 ga.); 120" used
		fuseholder, in-line:
XF603		Includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-134371	TUBING, heatsink (BLK) 1" length; 2 used

TLN5274B Regulator Board — PL-5361-B

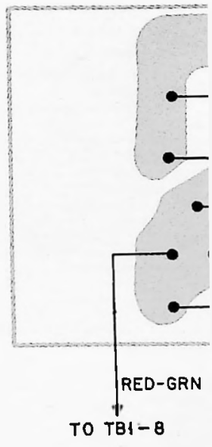
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed; uF: ± 10%; 50 V: unless otherwise stated
C1	8-82905G02	.022
C2	23-83908L01	100 + 75-10%; 25 V
C3, 4	8-82905G02	.022
		semiconductor device, diode: (see note)
CR5	48-82392B03	silicon
		transistor: (see note)
Q1, 2	48-869170	NPN; type M9170
		resistor, fixed: ± 5%; 1/2 W: unless otherwise stated
R1	6-125A41	470
R2	6-125A53	1.5k
R3	6-125A13	33
R4	17-82177B40	200; 5 W
R5, 6	6-126C41	470 ± 10%; 1 W
R7, 8	6-125A49	1k
R9, 10	6-125C73	10k ± 10% (note: Use is optional, determined at factory)
R11	6-125C51	1.2k ± 10%
		semiconductor device, diode: (see note)
VR1	48-83696E01	silicon; Zener type: 6.8 V ± 5%

note: Replacement diodes and transistors must be ordered by listed part number only for optimum performance.

TRN6282A Power Supply Chassis — PL-3349-F

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82464C08	11,000 uF + 75-10%; 35 V
		semiconductor device, diode: (see note)
CR1, 2	48-82732C07	silicon
CR3, 4	48-82732C10	silicon
		connector, receptacle:
J1		Includes:
	15-10183A53	INSULATOR, 6-contact
	29-82336A01	CONTACT, female; 4-req'd. (p/o Model TLN5219A)
		fuse, cartridge:
F1	65-804908	slow-blow type; 2A
		line cord:
P1	30-83212F01	includes: ac plug
		transistor: (see note)
Q3	48-869807	PNP; type M9807
Q4, 5	48-869244	NPN; type M9244
		switch, slide:
S1	40-84241G04	dpst
		transformer, power:
T1	25-83594E02	prl: res, 2.75 ohms sec: res 0.11 ohm
		terminal strip:
TB1	31-121700	8-terminals: no. 2 & 7 mtg.
		fuseholder:
XF1	9-82083C01	extractor post type
		non-referenced items
	1-80745B54	HEAT SINK ASSEMBLY includes:
	1-80745B55	TRANSISTOR & LUG ASSEMBLY; 2 req'd. Includes:
	4-474216	WASHER, insulator: 2 req'd.
	14-865854	INSULATOR, transistor
	29-84489B01	LUG, transistor: 2 req'd. TRANSISTOR Q4 or Q5
	1-80745B56	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	2-7005	NUT, hex: 6-32 x 1/4 x 3/32"; 4 req'd.
	3-2977	SCREW, machine: 6-32 x 1-1/8"; 4 req'd.
	4-7569	WASHER, flat: .145 x .312 x .027"; 4 req'd.
	4-7650	WASHER, lock: #6 (split); 2 req'd.
	4-84496C01	WASHER, shoulder; 4 req'd.
	26-84923B06	HEATSINK
	29-5248	LUG, soldering: #6; 2 req'd.
	1-80745B57	DIODE BRACKET ASSEMBLY includes:
	1-80745B56	WIRE & LUG ASSEMBLY includes:
	29-824456	LUG, ring tongue
	1-80745B58	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B60	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B61	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B86	DIODE ASSEMBLY, includes:
	7-83959A01	HEATSINK DIODES CR3 & CR4
	1-80745B87	DIODE ASSEMBLY, includes:
	7-83959A01	HEATSINK DIODES CR1 & CR2
	2-7005	NUT, hex: 6-32 x 1/4 x 3/32"; 4 req'd.
	3-7339	SCREW, machine: 6-32 x 5/8"; 4 req'd.
	3-134168	SCREW, tapping: 4-40 x 1/4"; 2 req'd.
	3-134268	SCREW, tapping: 4-40 x 7/16"; 2 req'd.
	4-114057	WASHER, flat: .125 x .312 x .032"
	4-821633	WASHER, shoulder; 4 req'd.
	7-83095F01	BRACKET, circuit board
	14-83168H01	INSULATOR: 1.280 x 2.40"; 2 req'd.
	14-84268A01	INSULATOR, transistor: 520 x .660"
	14-84525G01	INSULATOR, transistor (T066 base)
	29-5261	LUG, soldering: #6; 2 req'd.
	29-5369	LUG, soldering: #4
	1-80745B88	HOUSING ASSEMBLY, includes:
	13-868710	DECAL, patent
	15-83096F02	HOUSING
	1-80778B37	CHASSIS ASSEMBLY, includes:
	1-80747B60	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	1-80747B61	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	1-80747B62	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	1-80747B63	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	2-1355	NUT, hex: 8-32 x 5/16 x 1/8"; 4 req'd.
	2-7005	NUT, hex: 6-32 x 1/4 x 3/32"; 8 req'd.
	2-9627	NUT, hex: 4-40 x 3/16 x 3/32"; 2 req'd.
	2-82360B29	NUT, speed: 6-32 x 340 x .500; 2 req'd.
	3-2979	SCREW machine: 6-32 x 3/8"; 3 req'd.
	3-7346	SCREW machine: 6-32 x 3/4"
	3-139085	SCREW machine: 4-40 x 5/16"; 2 req'd.
	3-490773	SCREW machine: 6-32 x 9/16"; 4 req'd.
	4-2645	WASHER, lock: #6 (split); 8 req'd.
	4-9746	WASHER, lock: #8 (split); 4 req'd.
	4-114583	WASHER, lock: #4 (split); 2 req'd.
	4-82418B88	WASHER, insulator: .125 x .250 x .010"; 2 req'd.
	13-84639D04	ESCUTCHEON
	27-83093F01	CHASSIS
	42-82018H01	RETAINER, cable
	42-83415C01	CLIP, capacitor mounting
	43-82599M01	SPACER, 4 req'd.
	75-84215A02	BUMPER, recessed: 4 req'd.
	2-7005	NUT, hex: 6-32 x 1/4 x 3/32"; 2 req'd.
	2-82360B29	NUT, speed: 6-32; 4 req'd.
	3-2979	SCREW, machine: 6-32 x 3/8"; 4 req'd.
	3-121057	SCREW, machine: 6-32 x 3/8"; 4 req'd.
	3-134168	SCREW, tapping: 4-40 x 1/4"; 2 req'd.
	3-139138	SCREW, tapping: 10-32 x 3/8"; 3 req'd.
	4-2645	WASHER, lock: #6 (split); 4 req'd.
	33-84035E05	NAMEPLATE, model number
	42-10217A02	STRAP, cable harness; 3 req'd.
	54-84347M01	LABEL, warning
	9-10454A04	CONN. (YELLOW)

note: Replacement diodes and transistors must be ordered by listed part number only for optimum performance.



BASE STATION POWER SUPPLY

MODEL TPN1136A

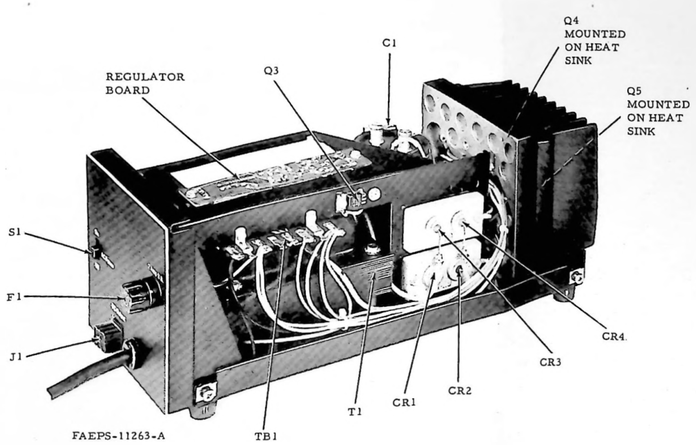
POWER CABLES

MODELS TKN6948A AND TKN6949A

FUNCTION

Provides the entire radio with regulated +14.5 V dc when used in a 120 V ac primary power fixed installation.

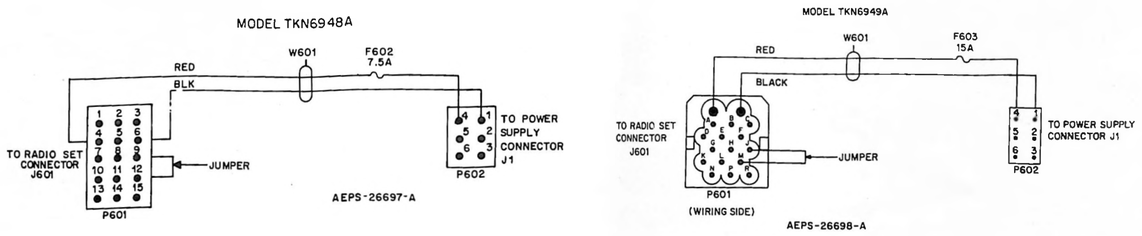
PARTS LOCATION



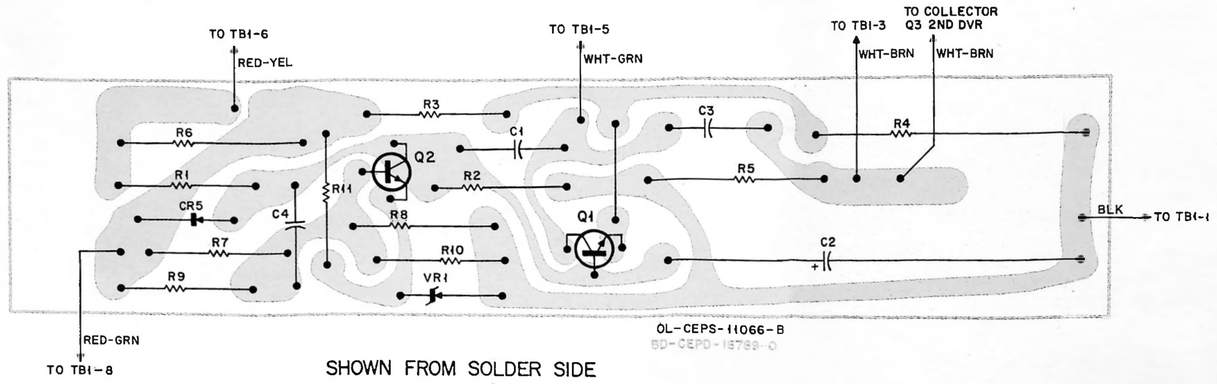
MODEL TABLE

MODEL	SUB-MODEL	VERSION	DESCRIPTION
TPN1136A	TLN5274B	O	REGULATOR BOARD
	TRN6282A	O	POWER SUPPLY CHASSIS
TKN6948A		O	POWER CABLE ("MAXAR")
TKN6949A		O	POWER CABLE ("MAXAR-80")

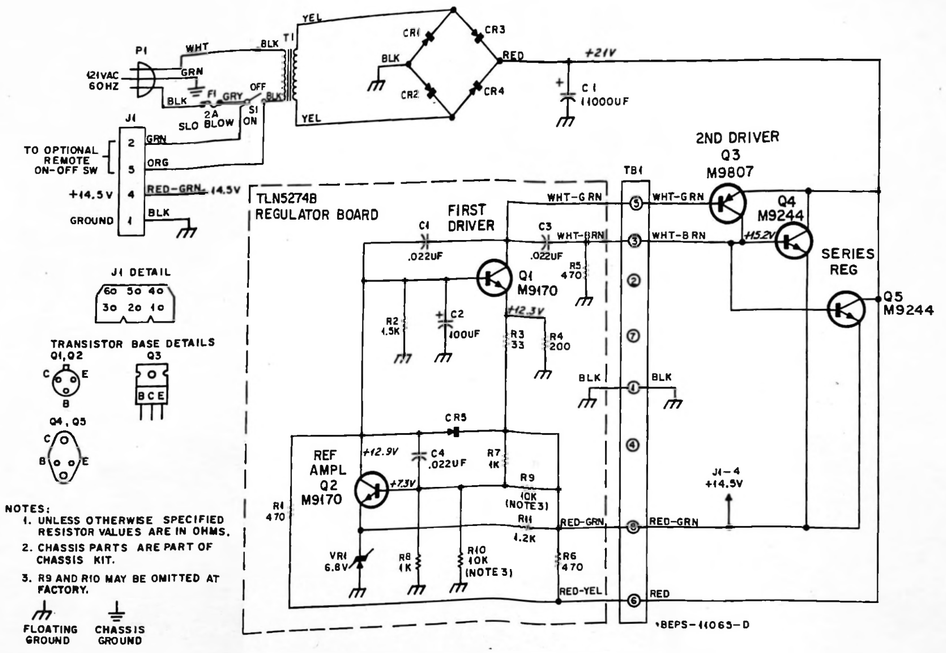
CABLE DETAILS



REGULATOR BOARD DETAIL



SHOWN FROM SOLDER SIDE



NOTES:
1. UNLESS OTHERWISE SPECIFIED RESISTOR VALUES ARE IN OHMS.
2. CHASSIS PARTS ARE PART OF CHASSIS KIT.
3. R9 AND R10 MAY BE OMITTED AT FACTORY.

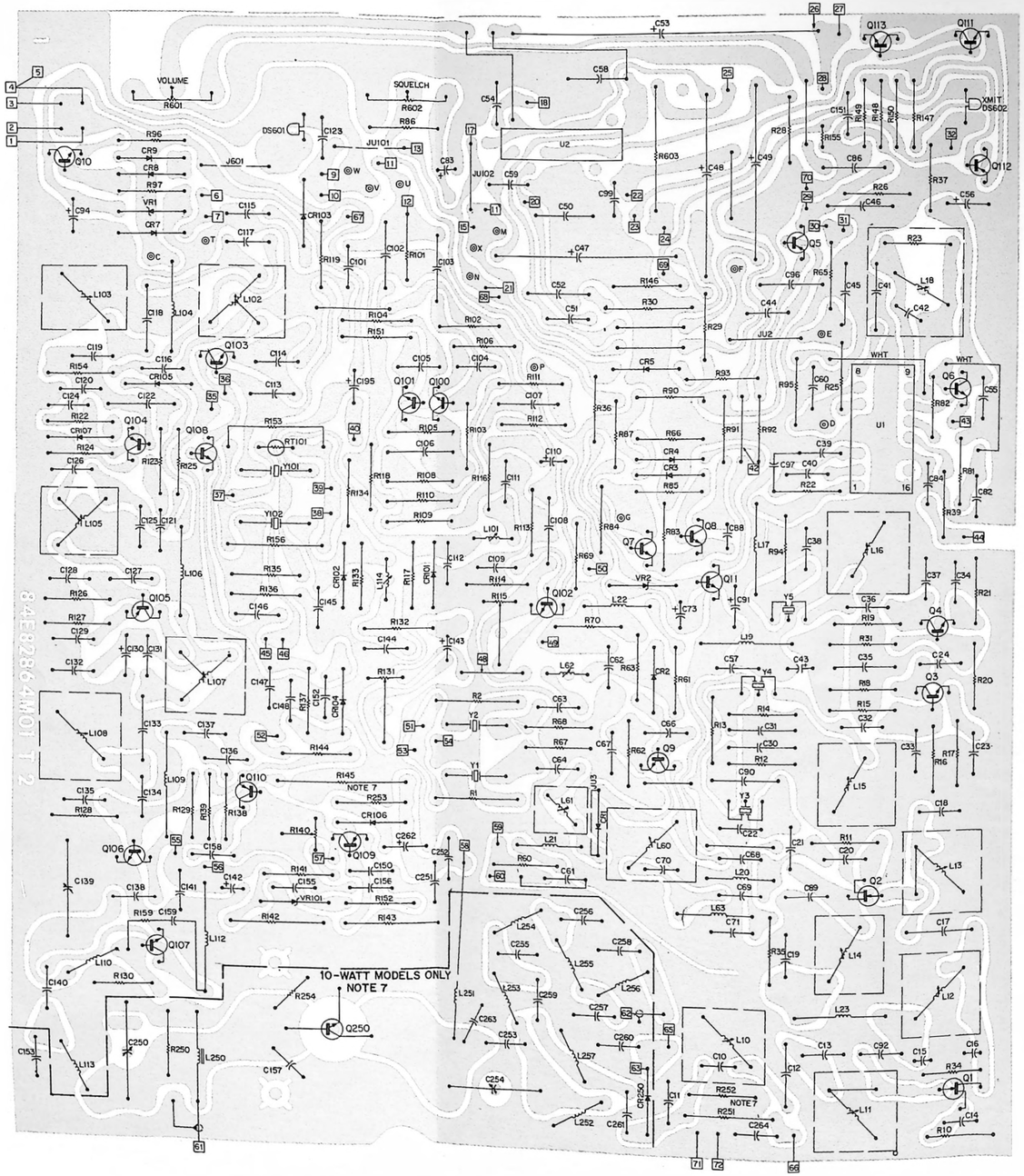
FLOATING GROUND CHASSIS GROUND

BASE STATION POWER SUPPLY AND POWER CABLES/UNIFIED CHASSIS

68P81029E96-J
2/1/81-PHI

UNIFIED CHASSIS

CIRCUIT BOARD DETAILS


84E82864AM01 T 2
10-WATT MODELS ONLY
NOTE 7
Q250
VOLUME
R601
SQUELCH
R602
XMIT
DS602
DS601
J601
U2
U1
WHT
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JU102
JU2
JU3
Q10
Q103
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Q5
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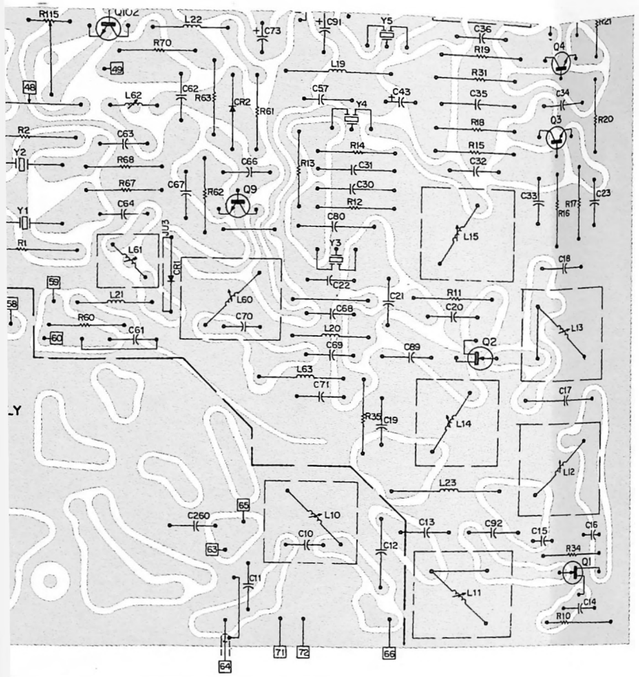
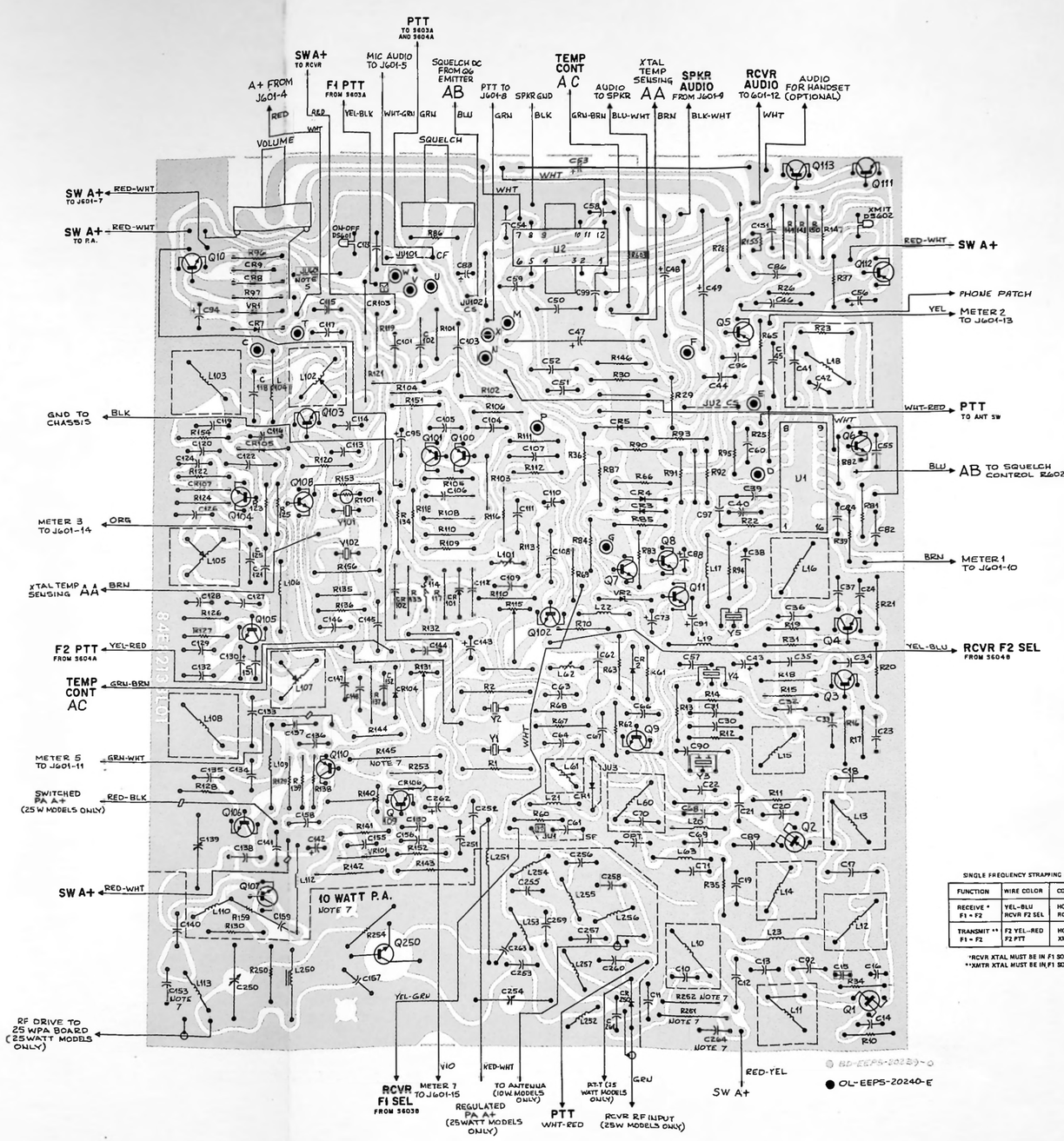


BD-DEPS-28285-O
OL-DEPS-28286-O

EARLIER MODELS



SINGLE FREQUENCY STRAPPING TABLE

FUNCTION	WIRE COLOR	CONNECTED TO
RECEIVE * F1 = F2	YEL-BLU RCVR F2 SEL	HOLE "H" RCVR F1 PAD
TRANSMIT ** F1 = F2	F2 YEL-RED F2 PTT	HOLE "Y" XMTR F1 PAD

*RCVR XTAL MUST BE IN F1 SOCKET
**XMTR XTAL MUST BE IN F1 SOCKET

USH-PIN TABLE

Function
Receiver
Switched A + to PL Board**
PL Tone to PL Board Decoder Input**
Audio to PL Board Audio High-Pass Filter Input**
Audio from PL Board Audio High-Pass Filter Output**
Squelch Control from PL Board Squelch Switch**
Transmitter
PTT to PL Board**
Delayed PTT form PL Board**
PL Tone from PL Board Encoder Output**
PL Ground
Microphone Audio High
Microphone Audio Low
Microphone PTT Ground
Microphone PTT

JUMPER TABLE

Jumper Number	In	Out
JU1	Single-Frequency Receiver Models	Two-Frequency Receiver Models
JU2	Carrier Squelch and DPL Models	Tone-Coded PL Models
JU102	Carrier Squelch Models	Tone-Coded and *Digital Private-Line* Models
JU3	Single-Frequency Receiver Models (CR1 Out)	Two-Frequency Receiver Models (CR1 In)
JU101	Single-Frequency Transmitter Models	Two-Frequency Transmitter Models
JU601	All Models	Optional (Disables PWR on Lamp)

CONNECTION CHART

Code	Function	Source	Color	Destination	Remarks
1.	SW A+ to J601	S601 via (4)	RED-WHT	J601-7	
2.	SW A+ Jumper (to Heater)	S601 via (4)	RED-WHT	(39)	
3.	SW A+ (to PA Area)	S601 via (4)	RED-WHT	(56)	
4.	SQ A+ from S601	S601	RED	S601	
5.	SW A+ to Status Message Terminal TOT	S601	RED-WHT		Connected at Switch Lug
6.	A+ to Switch	J601 via (7)	RED	S601	
7.	A+ from J601	(6)	RED	S601-4	
8.					NOT USED
9.	F1 PTT (Select Line/Delayed)	CR103	YEL-BLK	S603A	
10.	F1 PTT (Select Line/Delayed)				NOT USED
11.	Mike Audio to/from S601	Pin U	WHT-GRN	J601-5	
12.	Mike 8.8 Status Message Terminal	Pin U	BRN	Status Message Terminal	Status Message Terminal Only
13.	(Delayed) PTT Feed to S603A & S604A	Pin N	GRN	J603A, J604A	2-Freq. Radios
14.	Squelch DC (Jumper)	Squelch Pot	BLU	(43)	
15.	PTT	Pin X	GRN	J601-8	
16.	(Delayed) PTT from Status Message Terminal PA	J102 or (17)	WHT-GRN	Status Message Terminal	Status Message Terminal Only
17.	(Delayed) PTT from TOT	J102 or (16)	GRN-WHT	TOT	TOT only
18.	Speaker GND	Plating	BLK	Speaker	
19.					NOT USED
20.	Tone from TOT	Audio Chip	BRN	TOT	TOT Only
21.	Delayed PTT to Antenna SW	Pin N	WHT-RED	(65)	
22.					NOT USED
23.	Temp. Control	Collector Q113	GRN-BRN	46	
24.	Audio to Speaker	J601 via R603 & (25)	BLU-WHT	Speaker	
25.	Speaker Audio from J601	R603	BLK-WHT	J601-9	
26.	Tap Point for Audio PA Option	C53	WHT	(25)	Audio PA Option Only
27.	Audio for Handset	C53			Handset Option Only
28.	Audio to J601	C53	WHT	J601-12	
29.	Phone Patch				Phone Patch Option Only
30.	Disc. Out to Status Message Terminal	U1 via R56	YEL		Status Message Terminal Only
31.	Disc. to M2	U1 via R65	YEL	J601-13	
32.	SW A+ Feed from (67)	R37	RED-WHT	(67)	
33.	XMIT Tuning (Meter-3)	R123	ORG	J601-14	
34.	Disc. Aud. (Status Message Terminal)	R123	ORG	Status Message Terminal	Status Message Terminal Only
35.	GND for TOT/Audio PA	Plating	BLK	TOT/Audio PA	
36.					NOT USED
37.	XTAL Temp Sensing	RT101	BRN	69	
38.	A+ Jumper	(39) via 2	WHT	51	
39.	A+ Jumper (from 2)	(39)		2	
40.	GND Jumper from 72	C95		(72)	
41.	GND from Status Message Terminal	Res. Lead. R66	BLK		Solder to Res. Lead
42.	Old TOT/Audio PA Connection (A+)	Jumper	RED-WHT		Before Issue A
43.	Squelch Control	Q5	BLU	(14)	
44.	Meter 1	U1-13 via R39	BRN	J601-10	
45.	Temp Cont. Jumper	(46)	WHT	(54)	
46.	Temp Cont. Jumper	(45)	GRN-BRN	(23)	
47.	F2 PTT (Select Line/Delayed)	CR104	YEL-RED	S604A	
48.	IDC from Audio PA	R131, Jumper	BRN-BLU	PA	Solder to Jumper
49.	Rec F2 Select Line	L22	YEL-BLU	S604B	
50.	Jumper for F1 Rec. Switch Ckt.	R69	WHT	(59)	
51.	SW A+ Jumper	(R2)	WHT	(38)	

CONNECTION CHART (Cont'd.)

Code	Function	Source	Color	Destination	Remarks
52.	Feed for Meter 5	R144	GRN-WHT	S601-11	
53.	SW A+ Jumper	(51)	RED-ORG	66	NOT USED
54.	Temp Cont. Jumper	R2	WHT	(46)	
55.	SW A+ for 25 W PA	(56)	RED-BLK	25 W PA	
56.	SW A+ from 3 (Jumper)	L112		(3)	
57.	RF Inhibit (TOT)	Q109	BRN-YEL	TOT	TOT Only
58.	Sensed A+ for 25 W PA	R145	RED-WHT	25 W PA	
59.	Jumper for F1 Rel. Switch Ckt.	R60	WHT	(50)	
60.	Rec. F1 Select Line	R60	YEL-GRN	S603B	
61.	Exciter RF Feed to PA, 25 W	L113	(coax)	25 W PA	
62.	To 10 W Antenna Connector	L256	(coax)	RF Connector	10 W Only
63.	Delayed PTT to 25 W PA	(65)	GRN	25 W PA	
64.	Receiver RF Input, 25 W Only	CR250	(coax)	25 W PA	
65.	Delayed PTT Jumper	(65)	WHT-RED	(21)	
66.	SW A+ (Jumper)	R251	RED-ORG	(53)	
67.	A+ Jumper (to receiver)	J601 via (4)	RED-WHT	(32)	
68.	Delay PTT	Pin N		NOT USED	
69.	XTAL Sensing	Q111	BRN	37	
70.	A+ to TOT/Audio PA	(32)	RED-WHT	TOT, PA	
71.	GND	Plating	BLK	40	
72.	GND	Plating	BLK	J601-6	
73.	Meter 7	R145	VIO	J601-15	

SCHEMATIC AND CIRCUIT BOARD NOTES:

1. Refer to parts list for component value.
2. Unless otherwise noted, resistor values are in ohms, and capacitor values are in picofarads.
3. Voltage notations are as follows:

   T = transmitter keyed
   R = receive (transmitter unkeyed)
   U = receiver unsquelched
   S = receiver fully squelched

4. Unless otherwise noted, dc voltages are measured with a 20,000 ohm-per-volt meter, and rf voltages are measured with an rf voltmeter.
5. Refer to the jumper table for jumper connections used in various radio models, SF = single frequency jumper, CS = carrier squelch jumper.
6. U2 voltages measured with volume control fully counterclockwise (minimum volume).
7. The components enclosed in the heavy dashed outline plus R251, R252, and R253 form the 10- watt power amplifier. In the 10 W parts list, all the parts, except those indicated with a * are omitted for 25-watt models. In addition, C140, C153, C154, C157, C260, L61, L113, and R145 change value or are omitted in 25-watt models as shown in parts list. The 25-watt PA mounts on a separate circuit board and is shown on its own page in this manual.
8. Factory selected.

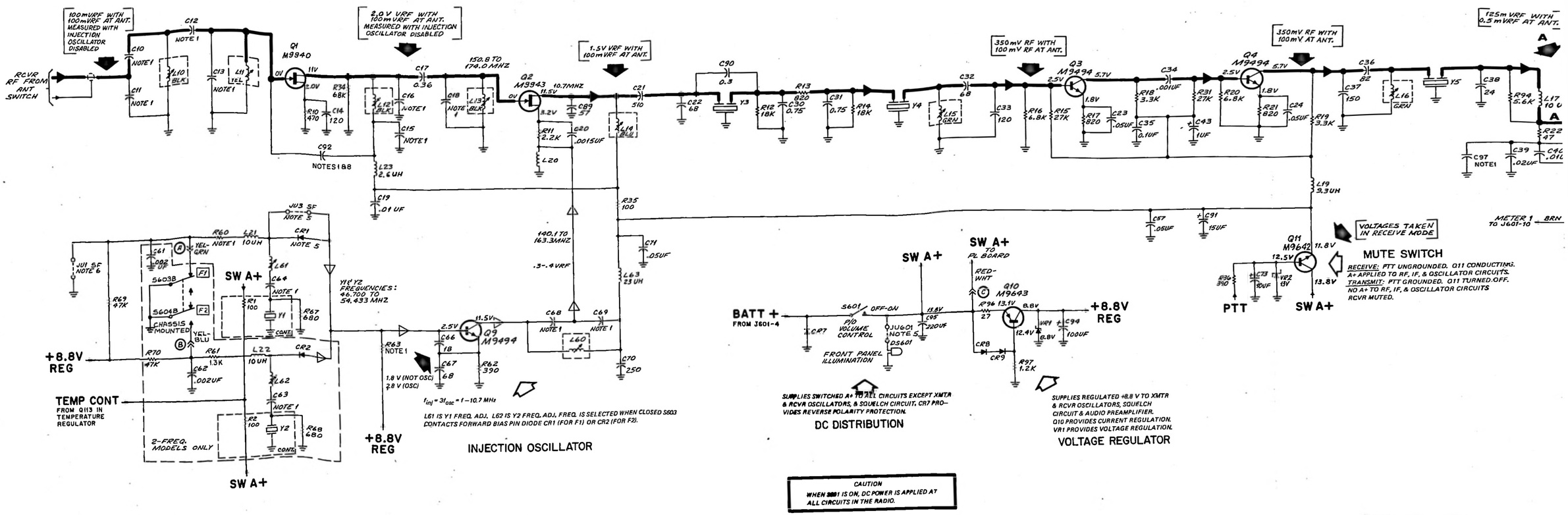
RF AMPLIFIER

MIXER

4-POLE 10.7 MHZ CRYSTAL FILTER

10.7 MHZ IF AMPLIFIER

2-POLE 10.7 MHZ CRYSTAL FILTER

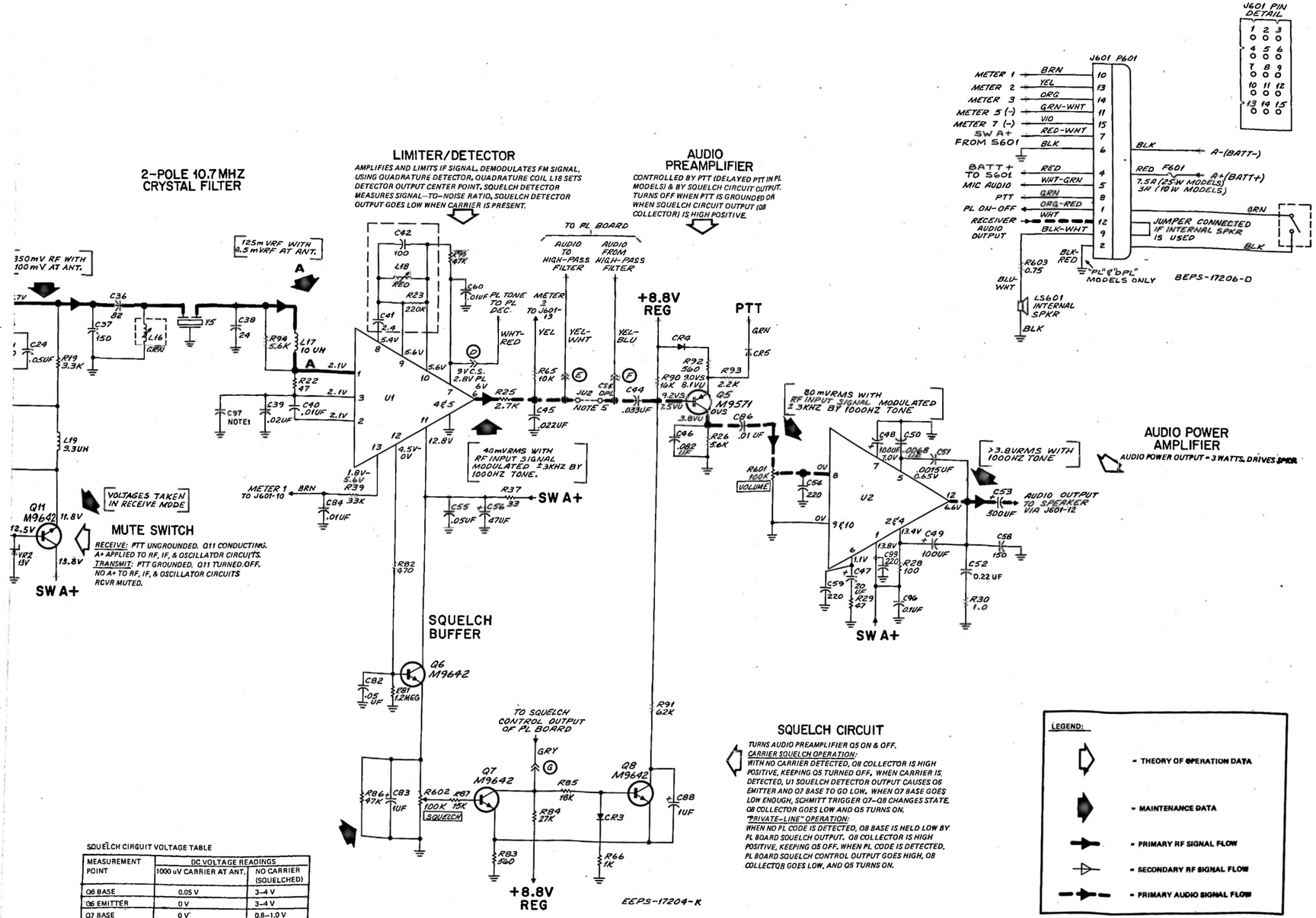


CAUTION

WHEN S601 IS ON, DC POWER IS APPLIED AT ALL CIRCUITS IN THE RADIO.

SQUELCH CIRCUIT VOLTAGE TABLE

MEASUREMENT POINT	DC VOLTAGE READINGS	
	1000 uV CARRIER AT ANT.	NO CARRIER (SQUELCHED)
Q6 BASE	0.05 V	3–4 V
Q6 EMITTER	0 V	3–4 V
Q7 BASE	0 V	0.8–1.0 V
Q7 EMITTER	0.08 V	0.2–0.3 V
Q7 COLLECTOR	4 V	0.2–0.3 V
Q8 BASE	0.75 V	0.2–0.3 V
Q8 EMITTER	0.08 V	0.2–0.3 V
Q8 COLLECTOR	0.1 V–0.5 V	8–9 V


2-POLE 10.7 MHZ CRYSTAL FILTER
LIMITER/DETECTOR
AMPLIFIES AND LIMITS IF SIGNAL. DEMODULATES FM SIGNAL, USING QUADRATURE DETECTOR. QUADRATURE COIL L18 SETS DETECTOR OUTPUT CENTER POINT. SQUELCH DETECTOR MEASURES SIGNAL-TO-NOISE RATIO. SQUELCH DETECTOR OUTPUT GOES LOW WHEN CARRIER IS PRESENT.
AUDIO PREAMPLIFIER
CONTROLLED BY PTT (DELAYED PTT IN PL MODELS) & BY SQUELCH CIRCUIT OUTPUT. TURNS OFF WHEN PTT IS GROUNDED OR WHEN SQUELCH CIRCUIT OUTPUT (Q8 COLLECTOR) IS HIGH POSITIVE.
TO PL BOARD
AUDIO TO HIGH-PASS FILTER
AUDIO FROM HIGH-PASS FILTER
+8.8V REG
PTT
.350mV RF WITH .100 mV AT ANT.
125m VRF WITH 3.3 mVRF AT ANT.
U1
U2
METER 1 TO J601-10
METER 3 TO J601-13
40 mVRMS WITH RF INPUT SIGNAL MODULATED ±3KHZ BY 1000HZ TONE.
80 mVRMS WITH RF INPUT SIGNAL MODULATED ±3KHZ BY 1000HZ TONE
>3.8VRMS WITH 1000HZ TONE
AUDIO POWER AMPLIFIER
AUDIO POWER OUTPUT = 3 WATTS. DRIVES SPKR
VOLUME
AUDIO OUTPUT TO SPEAKER VIA J601-12
SW A+
VOLTAGES TAKEN IN RECEIVE MODE
MUTE SWITCH
RECEIVE: PTT UNGROUNDED. Q11 CONDUCTING. A+ APPLIED TO RF, IF, & OSCILLATOR CIRCUITS.
TRANSMIT: PTT GROUNDED. Q11 TURNED OFF. NO A+ TO RF, IF, & OSCILLATOR CIRCUITS RCVR MUTED.
SQUELCH BUFFER
TO SQUELCH CONTROL OUTPUT OF PL BOARD
+8.8V REG
EEPS-17204-K
SQUELCH CIRCUIT
TURNS AUDIO PREAMPLIFIER Q5 ON & OFF.
CARRIER SQUELCH OPERATION:
WITH NO CARRIER DETECTED, Q8 COLLECTOR IS HIGH POSITIVE, KEEPING Q5 TURNED OFF. WHEN CARRIER IS DETECTED, U1 SQUELCH DETECTOR OUTPUT CAUSES Q8 EMITTER AND Q7 BASE TO GO LOW. WHEN Q7 BASE GOES LOW ENOUGH, SCHMITT TRIGGER Q7-Q8 CHANGES STATE. Q8 COLLECTOR GOES LOW AND Q5 TURNS ON.
"PRIVATE-LINE" OPERATION:
WHEN NO PL CODE IS DETECTED, Q8 BASE IS HELD LOW BY PL BOARD SQUELCH OUTPUT. Q8 COLLECTOR IS HIGH POSITIVE, KEEPING Q5 OFF. WHEN PL CODE IS DETECTED, PL BOARD SQUELCH CONTROL OUTPUT GOES HIGH, Q8 COLLECTOR GOES LOW, AND Q5 TURNS ON.
J601 P601
METER 1
METER 2
METER 3
METER 5 (-)
METER 7 (-)
SW A+ FROM S601
BATT+ TO S601
MIC AUDIO
PTT
PL ON-OFF
RECEIVER AUDIO OUTPUT
A-(BATT-)
A+(BATT+)
7.5A (25W MODELS) 3A (10W MODELS)
JUMPER CONNECTED IF INTERNAL SPKR IS USED
TRN6283A MICROPHONE HANG-UP BOX (PL MODELS ONLY)
"PL" & "DPL" MODELS ONLY
BEPS-17206-D
LS601 INTERNAL SPKR
J601 PIN DETAIL
LEGEND:
= THEORY OF OPERATION DATA
= MAINTENANCE DATA
= PRIMARY RF SIGNAL FLOW
= SECONDARY RF SIGNAL FLOW
= PRIMARY AUDIO SIGNAL FLOW

SQUELCH CIRGUIT VOLTAGE TABLE

MEASUREMENT POINT	DC VOLTAGE READINGS	
	1000 uV CARRIER AT ANT.	NO CARRIER (SQUELCHED)
Q6 BASE	0.05 V	3–4 V
Q6 EMITTER	0 V	3–4 V
Q7 BASE	0 V	0.8–1.0 V
Q7 EMITTER	0.08 V	0.2–0.3 V
Q7 COLLECTOR	4 V	0.2–0.3 V
Q8 BASE	0.75 V	0.2–0.3 V
Q8 EMITTER	0.08 V	0.2–0.3 V
Q8 COLLECTOR	0.1 V–0.5 V	8–9 V

UNIFIED CHASSIS
RECEIVER SECTION

FUNCTION

Amplifies, mixes, filters, and demodulates received rf energy from antenna (via antenna switch) and provides an amplified audio signal to the speaker.

SCHEMATIC AND CIRCUIT BOARD NOTES:

1. Refer to parts list for component value.
2. Unless otherwise noted, resistor values are in ohms, and capacitor values are in picofarads.
3. Voltage notations are as follows:

   T = transmitter keyed
   R = receive (transmitter unkeyed)
   U = receiver unsquelched
   S = receiver fully squelched

4. Unless otherwise noted, dc voltages are measured with a 20,000 ohm-per-volt meter, and rf voltages are measured with an rf voltmeter.
5. Refer to the jumper table for jumper connections used in various radio models, SF = single frequency jumper, CS = carrier squelch jumper.
6. U2 voltages measured with volume control fully counterclockwise (minimum volume).
7. The components enclosed in the heavy dashed outline plus R251, R252, and R253 form the 10-watt power amplifier. In the 10 W parts list, all the parts, except those indicated with a * are omitted for 25-watt models. In addition, C140, C153, C154, C157, C260, L61, L113, and R145 change value or are omitted in 25-watt models as shown in parts list. The 25-watt PA mounts on a separate circuit board and is shown on its own page in this manual.
8. Factory selected.

UNIFIED CHASSIS
RADIO SET PARTS LIST

parts list

Unified Chassis Parts — PL-3350-H

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		lamp:
DS601, 602	65-83376K01	type GE#73; 14 V
		fuse:
F601	65-86099	7.5A; 32 V
		connector, receptacle:
J601		includes:
	15-83292K01	SHELL
	29-84706E06	TERMINAL, female, 14 req'd.
J602	9-82442E09	female, single contact
		speaker:
LS601	50-83291K01	3-1/2 inch; 4-ohms
		resistor:
R601	18-83288K01	var: 100k; 30% @ 1/2 rotation
R602	18-83287K01	var; 100k
		switch:
S601	—	on/off (p/o R601 assembly)
		function selector assembly:
		one of the following:
S602	40-83290K02	MON only
S602, 605	40-83290K05	EXT, MON
S602, 603, 604	40-83290K01	F1-F2, MON
S602, 603, 605	40-83290K04	F2 IN, EXT, MON
S603, 604	40-83290K03	F1-F2
S603, 604, 605	40-83290K01	F1-F2, EXT
S605	40-83290K02	EXT only
		fuseholder:
XF601	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	29-84706E05	PIN, male; 4 req'd.
	41-82885A01	SPRING, fuseholder
	42-82884A01	CLIP, fuse; 2 req'd.
		non-referenced items
	9-83396K02	SOCKET, lamp: for DS601
	9-83396K03	SOCKET, lamp: for DS602
	38-82592L01	BUTTON, push; WHT
	38-82592L02	BUTTON, push; ORG
	15-84984L01	HOUSING
	33-83418K01	NAMEPLATE
	33-82321M01	NAMEPLATE, FCC
	36-83132K01	KNOB, control
	3-139990	SCREW, drive; 2 req'd.
	3-83001M02	SCREW, tapping, 2-56 x 3/16"
	4-84180C01	SHLD, washer
	3-139966	SCREW

notes:
1. For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency and crystal (or resonator) type number.

parts list

Unified Chassis
MODELS:
TUD1891AB (136-150.8 MHz) 1-Freq; 10-Watt
TUD1901AH (136-150.8 MHz) 2-Freq; 10-Watt
TUD1911AB (136-150.8 MHz) 1-Freq; 25-Watt
TUD1921AH (136-150.8 MHz) 2-Freq; 25-Watt
TUD1892AB (150.8-162 MHz) 1-Freq; 10-Watt
TUD1893AB (162-174 MHz) 1-Freq; 10-Watt
TUD1902AH (150.8-162 MHz) 2-Freq; 10-Watt
TUD1903AH (162-174 MHz) 2-Freq; 10-Watt
TUD1912AB (150.8-162 MHz) 1-Freq; 25-Watt
TUD1913AB (162-174 MHz) 1-Freq; 25-Watt
TUD1922AH (150.8-162 MHz) 2-Freq; 25-Watt
TUD1923AH (162-174 MHz) 2-Freq; 25-Watt

LEGEND
L = 136-150.8 MHz
M = 150.8-162 MHz
H = 162-174 MHz

Receiver — PL-3353-K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±5%; 500 V: unless otherwise stated
C10L	21-82240K03	13; N150
C10M	21-84713A30	10; N150
C10H	21-84713A35	9; N150
C11L	21-83406D06	39; N220
C11M	21-82133G39	36; N150
C11H	21-82133G83	33; N150
C12L	21-82450B16	0.62
C12M	21-864519	0.56 ± 10%
C12H	21-82450B29	0.51
C13L	21-83406D89	10; NP0
C13M	21-84493B40	6.8; N150
C13H	21-863466	5; N150
C14	21-82877B15	120; N150
C15L	21-82240K08	62; N150
C15M	21-82240K07	50; 2%; N150
C15H	21-84713A31	43; N150
C16L	21-84713A16	12; N150
C16M	21-84713A35	9; N150
C16H	21-84713A46	7 ± 0.25 pF; N150
C17L	21-82450B37	0.47
C17M, H	21-842041	0.36
C18L	21-82133G14	7.5; NP0
C18M	21-82133G76	6.8 ± .2%; N150
C18H	21-863466	5; N150
C19	21-82428B59	.01 uF + 80-20%; 200 V
C20	21-82187B18	.0015 uF ± 10%; 200 V
C21	21-845214	510
C22	21-82610C30	68; 200 V
C23, 24	21-82372C04	.05 uF + 80-20%; 25 V
C30, 31	21-82450B06	0.75 ± 10%; 500 V
C32	21-82610C30	68; 200 V
C33	21-82610C09	120; 200 V
C34	21-82187B20	.001 uF ± 10%; 200 V
C35	21-82372C01	0.1 uF + 80-20%; 25 V
C36	21-82610C20	82; 200 V
C37	21-863147	150 ± 10%; 500 V
C38	21-82133G46	24
C39	21-82428B26	.02 uF + 80-20%; 200 V
C40	21-82428B59	.01 uF + 80-20%; 200 V
C41	21-82450B14	2.4
C42	21-82358G12	100; N080
C43	23-84665F04	1 uF + 150-0%; 35 V
C44	8-82905G08	.033 uF ± 10%; 50 V
C45	8-84496D07	.022 uF ± 10%; 100 V
C46	8-82905G45	.082 uF ± 10%; 50 V
C47	23-82601A03	20 uF; 25 V
C48, 49	23-84669A19	100 uF + 150-10%; 20 V
C50	8-84496D08	.0068 uF
C51	21-82187B18	.0015 uF ± 10%; 200 V
C52	8-82905G32	.22 uF ± 10% 50 V
C53	23-83210A19	500 uF ± 1 + 10%; 50 V
C54	21-83596E10	220 ± 20%; 200 V
C55	21-82372C04	.05 uF + 80-20%; 25 V
C56	23-84538G06	47 uF
C57	21-82372C04	.05 uF + 80-20%; 25 V
C58	21-84713A25	150
C59	21-83596E10	220 ± 20%; 200 V
C60	21-82428B59	.01 uF + 80-20%; 200 V
C61, 62	21-82428B25	.002 uF ± 20% (2-freq. only)
C63L	21-82610C57	47; N220 (2-freq. only)
C64L	21-82610C57	47; N220
C63M, 64M	21-82355B15	24; N750
C63H, 64H	21-125929	15; N750
C66L	21-82133G75	30; N150
C66M, H	21-865942	18; N470
C67	21-82610C30	68; 200 V
C68L	21-83406D89	10; NP0
C68M	21-83406D15	9; N150
C68H	21-864746	6; N150
C69L	21-82610C87	47; N220
C69M	21-82610C02	43; 200 V
C69H	21-855809	33; N150
C70	21-82877B36	250; N750
C71	21-82372C04	.05 uF + 80-20%; 25 V
C73	23-84665F01	10 uF
C82	21-82372C04	.05 uF + 80-20%; 25 V
C84	21-82428B59	.01 uF + 80-20%; 200 V
C86	8-84496D03	.01 uF ± 10%; 250 V
C88	23-84665F04	1 uF + 150-0%; 35 V
C89	21-82610C47	57; 100 V
C90	21-82450B26	0.3 ± 10%
C91	23-84538G04	15 uF
C92	21-83406D03	2.2 ± 0.25; NP0
	or 21-83406D53	3.3 ± 0.25; NP0
	or 21-83406D66	2.7 ± 0.25; NP0
C94	23-84665F03	100 uF; 50 V
C95	23-84665F06	220 uF; 25 V
C96	21-82372C09	0.1 uF + 80-20%; 25 V
C97L	21-82610C51	120; N470
C99	21-83596E10	220 ± 20%; 200 V
		diode: (see note 1)
CR1, 2	48-83610C03	silicon; PIN type (2-freq. only)
CR3, 4, 5	48-83654H01	silicon
CR7	48-82466H13	silicon
CR8, 9	48-83654H01	silicon
		coil, rf:
L10	24-83972A11	3-1/2 turns; coded BLK
L11	24-83972A01	2-1/2 turns; coded BLK
L12, 13	24-83972A11	3-1/2 turns; coded BLK
L14	24-84419D02	22-1/2 turns
L15, 16	24-84419D03	33-1/2 turns
L17	24-82549D25	10 uH
L18	24-84419D07	23-1/2 turns; coded RED
L19	24-82835G20	9.3 uH
L20	24-82723H04	0.29 uH
L21, 22	24-82723H07	10 uH (2 freq. only)
L23	24-82835G08	choke; 2.6 uH
L60	24-84972A14	4-1/2 turns; coded RED
L61	24-83601K01	18-1/2 turns; coded WHT (25 W only)
	or 24-84922C09	21-1/2 turns (10 W only)
L62	24-83601K01	18-1/2 turns; coded WHT (2-freq. only)
L63	24-82723H03	choke; 23 uH
		transistor: (see note 1)
Q1	48-869940	field-effect; type M9940
Q2	48-869943	field-effect; type M9943
Q3, 4	48-869494	NPN; type M9494
Q5	48-869571	PNP; type M9571
Q6, 7, 8	48-869642	NPN; type M9642
Q10	48-869643	PNP; type M9643
Q11	48-869642	NPN; type M9642
		resistor, fixed: ± 10%; 1/4 W: unless otherwise stated
R1, 2	6-125A25	100 ± 5%; 1/2 W
R10	6-124C41	470
R11	6-124C57	2.2k
R12	6-124C79	18k
R13	6-124C47	820
R14	6-124C79	18k
R15	6-124C83	27k
R16	6-124C69	6.8k
R17	6-124C47	820
R18, 19	6-124C61	3.3k
R20	6-124C69	6.8k
R21	6-124C47	820
R22	6-124A17	47 ± 5%
R23	6-124D06	220k
R25	6-124C59	2.7k
R26	6-124A67	5.6k ± 5%
R28	6-124C25	100
R29	6-124C17	47
R30	6-125D70	1 ± 10%; 1/2 W
R31	6-124C83	27k
R34	6-124A69	6.8k ± 5%
R35	6-124C25	100
R36	6-124A39	390 ± 5%
R37	6-124C13	33
R39	6-124C85	33k
R60	6-124A63	1.3k (2-freq. only)
	or 6-124C63	3.9k (1-freq. only)
R61	6-124A63	1.3k (2-freq. only)
R62	6-124C39	390
R63	6-124A73	10k ± 5% (1-freq. only)
	or 6-124A63	1.3k ± 5% (2-freq. only
R65	6-124C73	10k
R66	6-124A49	1k ± 5%
R67	6-124C45	680
R68	6-124C45	680 (2-freq. only)
R69, 70	6-124C89	47k (2-freq. only)
R81	6-124B24	1.2M ± 5%
R82	6-124C41	470
R83	6-124A43	560 ± 5%
R84	6-124A83	27k ± 5%
R85	6-124A79	18k ± 5%
R86	6-124A89	47k ± 5%
R87	6-124C77	15k
R90	6-124A78	16k ± 5%
R91	6-124A92	62k ± 5%
R92	6-124A43	560 ± 5%
R93	6-124C57	2.2k
R94	6-124A67	5.6k ± 5%
R95	6-124C89	47k
R96	6-124A11	27 ± 5%
R97	6-124C51	1.2k
		integrated circuit:
U1	51-84561L84	type M2078
U2	51-84621K80	type M2077
		voltage regulator:
VR1	48-82256C56	Zener type, 8.8 V
VR2	48-82256C50	Zener type, 13 V
		crystal: (see note 2)
Y1, 2	KXN6122AA	46.700 — 54.433 MHz (1 and 2 freq.)
	or KXN6122AH	41.7666 — 46.7000 MHz (1 and 2 freq.)
Y3, 4, 5	48-84396K01	I-f; 10.7 MHz
		non-referenced items
	9-83487K01	SOCKET, crystal for Y1, Y2
	26-83264F01	SHIELD, coil
	26-84598A01	SHIELD, coil; large hole (for RF & OSC coil)
	26-84598A02	SHIELD, coil; small hole (for I-f coil)
	26-82570L01	HEATSINK (used with U2)
	26-82571L01	HEATSINK (used with U2)
	26-82570L01	HEATSINK: 1.20 x .90" (used with U2)
	26-82571L01	HEATSINK: .59 x .32" (used with U2)

NOTE
Parts with an * indicate components that are also used with 25 W power amplifier models. All other 10 W power amplifier parts are deleted in 25 W models.

Power Amplifier, 10-Watt:
(p/o Unified Chassis In 10-Watt Models) — PL-3354-F

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±5%; 500 V: unless otherwise stated
C250L, M	20-83201B03	var; 20-115
C250H	20-83201B02	var; 8-60
C251*	21-83596E10	220 ± 20%; 500 V
C252	21-82372C04	.05 + 80-20%; 25 V
C252*	21-82372C10	.05 uF + 80-20%; 25 V (25 W models only)
C253	21-84494B36	13
C254	20-83201B02	var; 8-60
C255L, M	21-83406D79	18; N150
C255H	21-83406D97	15; NP0
C256L, M	21-83406D82	36; NP0
C256H	21-83406D69	30; NP0
C257L, M	21-83406D71	33; NP0
C257H	21-83406D68	27; NP0
C258L, M	21-83406D79	18; N150
C258H	21-83406D97	15; NP0
C259L	21-82204B58	20; NP0
C259M, H	21-83406D79	18; N150
C260*	21-82204B06	100 ± 10%; 500 V
	or 21-83596E10	220 ± 10%; (25 W models only)
C261L	21-82204B58	20; NP0
C261M, H	21-93406D79	18; N150
C262*	23-84538G04	15 uF
C263	21-867845	3 ± .5
C264	21-83596E10	220 ± 20%; (10 W models only)
		diode: (see note)
CR250	48-83510F04	silicon
		coil, rf:
L250	24-83977B01	1-1/2 turns
L251L, M, H	24-84346A02	choke; 230 nH
L252	24-83884G06	4-1/2 turns; coded WHT
L253	24-83884G04	7-1/2 turns; coded YEL
L254L, M	24-83884G09	6-1/2 turns; coded BLU
L254H	24-83884G08	5-1/2 turns; coded ORG
L255L, M	24-83884G09	6-1/2 turns; coded BLU
L255H	24-83884G08	5-1/2 turns; coded ORG
L256L, M	24-83884G09	6-1/2 turns; coded BLU
L256H	24-83884G08	5-1/2 turns; coded ORG
L257, L257L	24-83884G09	6-1/2 turns; coded BLU
L257M, H	24-83884G08	5-1/2 turns; coded ORG
		transistor: (see note)
Q250	48-869680	NPN; type M9860
		resistor, fixed: ± 10%; 1/4 W: unless otherwise stated
R158L	6-126C27	120; 1 W
R250	6-124C25	100
R251	6-125C47	820; 1/2 W
R252	6-124C63	2.9k
R253*	6-124D55	2.7
R254L	6-125C01	10; 1/2 W
R254M, H	6-125C07	18; 1/2 W
		non-referenced item
	26-84716D01	HEATSINK

Exciter (p/o Unified Chassis) — PL-3352-H

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±5%; 500 V; unless otherwise stated
C101	21-83596E10	220 ± 20%
C102, 103	8-82905G08	.033 uF ± 10%; 50 V
C104, 105	21-83596E10	220 ± 20%
C106	8-82905G10	.015 uF ± 10%; 50 V
C107	21-82428B15	.005 uF
C108	8-82905G21	.018 uF ± 10%; 100 V
C109	21-82187B18	.0015 uF ± 10%; 100 V
C110	23-84665F01	10 uF + 100-10%; 25 V
C111	21-850510	470 ± 10%; 300 V
C112L, M	21-82204B51	62; N220
C112H	21-82610C21	62; N220
C113	21-84494B52	91
C114	21-84494B15	300
C115, 116	21-82428B59	.01 uF + 80-20%; 200 V
C117L	21-82204B29	43
C117M	21-82133G39	36; N150
C117H	21-82133G75	30; N150
C118L	21-82450B16	0.62
C118M, H	21-82450B29	.51
C119L	21-82133G35	56; NP0
C119M	21-83406D18	47
C119H	21-82133G39	36
C120	21-863147	150
C121	21-82187B20	.001 uF ± 10%; 100 V
C122	21-82450B10	4.3
C123	21-83596E10	220 ± 20%
C124, 125, 126	21-82428B59	.01 uF + 80-20%; 200 V
C127L	21-82610C29	51
C127M	21-82610C03	47
C127H	21-83406D42	43
C128L	21-82187B08	220
C128M	21-863147	150
C128H	21-82610C44	100; 100 V
C129L	21-859942	220; 100 V
C130	23-84538G04	15 uF
C131L	21-82133G01	10
C131M	21-82133G22	8 ± .5 pF; NP0
C131H	21-82133G26	6 ± .5 pF; NP0
C132L	21-859942	220; 100 V
C133L	21-82450B16	0.62
C133M, H	21-82450B29	.51
C134L	21-82989E31	14
C134M	21-82133G21	10 ± .5 pF; NP0
C134H	21-82133G22	8 ± .5 pF; NP0
C135	21-82133G41	4.7 ± .25 pF; NP0
C136	21-82204B06	100 ± 10%; N1500
C137	21-82372C04	.05 uF + 80-20%; 25 V
C138L, M	21-83406D69	30
C138H	21-83406D81	20
C139	20-83201B02	var; 8-60 pF
C140	21-84494B32	20 (10 W only)
	or 21-83566E10	220 (25 W only)
C141L	21-859942	220; 100 V
C142	23-84665F01	10 uF + 100-0%; 35 V
C143	23-84465F01	10 uF + 100-10%; 25 V (2-freq. only)
C144	21-850510	470 ± 10%; 300 V (2-freq. only)
C145L, M	21-82204B51	62; N330 (2-freq. only)
C145H	21-82610C21	62; N220 (2-freq. only)
C146	21-84494B52	91 (2-freq. only)
C147	21-84494B15	300 (2-freq. only)
C148	21-82428B59	.01 uF + 80-20%; 200 V (2-freq. only)
C150	21-83596E10	220 ± 20%
C151	21-82372C04	.05 uF + 80-20%; 25 V
C152	21-83596E10	220 ± 20%
C153L, M	21-83406D70	8 ± .25; NP0 (10 W only)
C153H	21-83406D84	6.8; NP0 (10 W only)
C154L	21-84494B31	19; 500 V
C154M, H	21-84494B36	13 (25 W only)
C155	21-83596E10	220 ± 20%
C156	21-82372C04	.05 uF + 80-20%; 25 V
C157	21-871966	5 (25 W only)
C159L	21-82428B47	.02 uF (25 W only)
		diode: (see note)
CR101	48-82190H53	varactor
CR102	48-82190H53	varactor (2-freq. only)
CR103	48-83654H01	silicon
CR104	48-83654H01	silicon (2-freq. only)
CR105	48-82139G01	germanium
CR106, 107	48-83654H01	silicon
		coil, rf:
L101L	24-84922C09	21-1/2 turns
L101M, H	24-83601K01	18-1/2 turns
L102	24-84972A06	8-1/2 turns; coded ORG
L103	24-84972A04	8-1/2 turns; coded WHT
L104	24-82835G13	0.82 uH
L105	24-84972A05	8-1/2 turns; coded RED
L106	24-82835G13	0.82 uH
L107	24-84972A26	3-1/2 turns; coded BLU
L108	24-84972A11	3-1/2 turns
L109	24-800484	0.31 uH

UNIFIED CHASSIS
RADIO SET PARTS LIST

parts list

Unified Chassis Parts — PL-3350-H

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		lamp:
DS601, 602	65-83376K01	type GE#73; 14 V
		fuse:
F601	65-86099	7.5A; 32 V
		connector, receptacle:
J601		includes:
	15-83292K01	SHELL
	29-84706E06	TERMINAL, female, 14 req'd.
J602	9-82442E09	female, single contact
		speaker:
LS601	50-83291K01	3-1/2 inch; 4-ohms
		resistor:
R601	18-83288K01	var: 100k; 30% @1/2 rotation
R602	18-83287K01	var; 100k
		switch:
S601	—	on/off (p/o R601 assembly)
		function selector assembly: one of the following:
S602	40-83290K02	MON only
S602, 605	40-83290K05	EXT, MON
S602, 603, 604	40-83290K01	F1-F2, MON
S602, 603, 605	40-83290K04	F2 IN, EXT, MON
S603, 604	40-83290K03	F1-F2
S603, 604, 605	40-83290K01	F1-F2, EXT
S605	40-83290K02	EXT only
		fuseholder:
XF601	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	29-84706E05	PIN, male; 4 req'd.
	41-82885A01	SPRING, fuseholder
	42-82884A01	CLIP, fuse; 2 req'd.

non-referenced items

9-83396K02	SOCKET, lamp: for DS601
9-83396K03	SOCKET, lamp: for DS602
38-82592L01	BUTTON, push; WHT
38-82592L02	BUTTON, push; ORG
15-84984L01	HOUSING
33-83418K01	NAMEPLATE
33-82321M01	NAMEPLATE, FCC
36-83132K01	KNOB, control
3-139990	SCREW, drive; 2 req'd.
3-83001M02	SCREW, tapping, 2-56 x 3/16"
4-84180C01	SHLD, washer
3-139966	SCREW

notes:
1. For optimum performance, diodes, transistors and integrated circuits must be ordered by Motorola part numbers.
2. When ordering quartz crystal units or ceramic resonators, specify carrier frequency, crystal (or resonator) frequency and crystal (or resonator) type number.

parts list

Unified Chassis
MODELS:
TUD1891AB (136-150.8 MHz) 1-Freq; 10-Watt
TUD1901AH (136-150.8 MHz) 2-Freq; 10-Watt
TUD1911AB (136-150.8 MHz) 1-Freq; 25-Watt
TUD1921AH (136-150.8 MHz) 2-Freq; 25-Watt
TUD1892AB (150.8-162 MHz) 1-Freq; 10-Watt
TUD1893AB (162-174 MHz) 1-Freq; 10-Watt
TUD1902AH (150.8-162 MHz) 2-Freq; 10-Watt
TUD1903AH (162-174 MHz) 2-Freq; 10-Watt
TUD1912AB (150.8-162 MHz) 1-Freq; 25-Watt
TUD1913AB (162-174 MHz) 1-Freq; 25-Watt
TUD1922AH (150.8-162 MHz) 2-Freq; 25-Watt
TUD1923AH (162-174 MHz) 2-Freq; 25-Watt

LEGEND
L = 136-150.8 MHz
M = 150.8-162 MHz
H = 162-174 MHz

Receiver — PL-3353-K

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±5%; 500 V: unless otherwise stated
C10L	21-82240K03	13; N150
C10M	21-84713A30	10; N150
C10H	21-84713A35	9; N150
C11L	21-83406D06	39; N220
C11M	21-82133G39	36; N150
C11H	21-82133G83	33; N150
C12L	21-82450B16	0.62
C12M	21-864519	0.56 ± 10%
C12H	21-82450B29	0.51
C13L	21-83406D89	10; NP0
C13M	21-84493B40	6.8; N150
C13H	21-863466	5; N150
C14	21-82877B15	120; N150
C15L	21-82240K08	62; N150
C15M	21-82240K07	50; 2%; N150
C15H	21-84713A31	43; N150
C16L	21-84713A16	12; N150
C16M	21-84713A35	9; N150
C16H	21-84713A46	7 ± 0.25 pF; N150
C17L	21-82450B37	0.47
C17M, H	21-842041	0.36
C18L	21-82133G14	7.5; NP0
C18M	21-82133G76	6.8 ± .2%; N150
C18H	21-863466	5; N150
C19	21-82428B59	.01 uF + 80-20%; 200 V
C20	21-82187B18	.0015 uF ± 10%; 200 V
C21	21-845214	510
C22	21-82610C30	68; 200 V
C23, 24	21-82372C04	.05 uF + 80-20%; 25 V
C30, 31	21-82450B06	0.75 ± 10%; 500 V
C32	21-82610C30	68; 200 V
C33	21-82610C09	120; 200 V
C34	21-82187B20	.001 uF ± 10%; 200 V
C35	21-82372C01	0.1 uF + 80-20%; 25 V
C36	21-82610C20	82; 200 V
C37	21-863147	150 ± 10%; 500 V
C38	21-82133G46	24
C39	21-82428B26	.02 uF + 80-20%; 200 V
C40	21-82428B59	.01 uF + 80-20%; 200 V
C41	21-82450B14	2.4
C42	21-82358G12	100; N080
C43	23-84665F04	1 uF + 150-0%; 35 V
C44	8-82905G08	.033 uF ± 10%; 50 V
C45	8-84496D07	.022 uF ± 10%; 100 V
C46	8-82905G45	.082 uF ± 10%; 50 V
C47	23-82601A03	20 uF; 25 V
C48, 49	23-84669A19	100 uF + 150-10%; 20 V
C50	8-84496D08	.0068 uF
C51	21-82187B18	.0015 uF ± 10%; 200 V
C52	8-82905G32	.22 uF ± 10% 50 V
C53	23-83210A19	500 uF ± 1 + 10%; 50 V
C54	21-83596E10	220 ± 20%; 200 V
C55	21-82372C04	.05 uF + 80-20%; 25 V
C56	23-84538G06	47 uF
C57	21-82372C04	.05 uF + 80-20%; 25 V
C58	21-84713A25	150
C59	21-83596E10	220 ± 20%; 200 V
C60	21-82428B59	.01 uF + 80-20%; 200 V
C61, 62	21-82428B25	.002 uF ± 20% (2-freq. only)
C63L	21-82610C57	47; N220 (2-freq. only)
C64L	21-82610C57	47; N220
C63M, 64M	21-82355B15	24; N750
C63H, 64H	21-125929	15; N750
C66L	21-82133G75	30; N150
C66M, H	21-865942	18; N470
C67	21-82610C30	68; 200 V
C68L	21-83406D89	10; NP0
C68M	21-83406D15	9; N150
C68H	21-864746	6; N150
C69L	21-82610C87	47; N220
C69M	21-82610C02	43; 200 V
C69H	21-855809	33; N150
C70	21-82877B36	250; N750
C71	21-82372C04	.05 uF + 80-20%; 25 V
C73	23-84665F01	10 uF
C82	21-82372C04	.05 uF + 80-20%; 25 V
C84	21-82428B59	.01 uF + 80-20%; 200 V
C86	8-84496D03	.01 uF ± 10%; 250 V
C88	23-84665F04	1 uF + 150-0%; 35 V
C89	21-82610C47	57; 100 V
C90	21-82450B26	0.3 ± 10%
C91	23-84538G04	15 uF
C92	21-83406D03	2.2 ± 0.25; NP0
	or 21-83406D53	3.3 ± 0.25; NP0
	or 21-83406D66	2.7 ± 0.25; NP0
C94	23-84665F03	100 uF; 50 V
C95	23-84665F06	220 uF; 25 V
C96	21-82372C09	0.1 uF + 80-20%; 25 V
C97L	21-82610C51	120; N470
C99	21-83596E10	220 ± 20%; 200 V
		diode: (see note 1)
CR1, 2	48-83610C03	silicon; PIN type (2-freq. only)
CR3, 4, 5	48-83654H01	silicon
CR7	48-82466H13	silicon
CR8, 9	48-83654H01	silicon
		coil, rf:
L10	24-83972A11	3-1/2 turns; coded BLK
L11	24-83972A01	2-1/2 turns; coded BLK
L12, 13	24-83972A11	3-1/2 turns; coded BLK
L14	24-84419D02	22-1/2 turns
L15, 16	24-84419D03	33-1/2 turns
L17	24-82549D25	10 uH
L18	24-84419D07	23-1/2 turns; coded RED
L19	24-82835G20	9.3 uH
L20	24-82723H04	0.29 uH
L21, 22	24-82723H07	10 uH (2 freq. only)
L23	24-82835G08	choke; 2.6 uH
L60	24-84972A14	4-1/2 turns; coded RED
L61	24-83601K01	18-1/2 turns; coded WHT (25 W only)
	or 24-84922C09	21-1/2 turns (10 W only)
L62	24-83601K01	18-1/2 turns; coded WHT (2-freq. only)
L63	24-82723H03	choke; 23 uH
		transistor: (see note 1)
Q1	48-869940	field-effect; type M9940
Q2	48-869943	field-effect; type M9943
Q3, 4	48-869494	NPN; type M9494
Q5	48-869571	PNP; type M9571
Q6, 7, 8	48-869642	NPN; type M9642
Q10	48-869643	PNP; type M9643
Q11	48-869642	NPN; type M9642
		resistor, fixed: ± 10%; 1/4 W: unless otherwise stated
R1, 2	6-125A25	100 ± 5%; 1/2 W
R10	6-124C41	470
R11	6-124C57	2.2k
R12	6-124C79	18k
R13	6-124C47	820
R14	6-124C79	18k
R15	6-124C83	27k
R16	6-124C69	6.8k
R17	6-124C47	820
R18, 19	6-124C61	3.3k
R20	6-124C69	6.8k
R21	6-124C47	820
R22	6-124A17	47 ± 5%
R23	6-124D06	220k
R25	6-124C59	2.7k
R26	6-124A67	5.6k ± 5%
R28	6-124C25	100
R29	6-124C17	47
R30	6-125D70	1 ± 10%; 1/2 W
R31	6-124C83	27k
R34	6-124A69	6.8k ± 5%
R35	6-124C25	100
R36	6-124A39	390 ± 5%
R37	6-124C13	33
R39	6-124C85	33k
R60	6-124A63	1.3k (2-freq. only)
	or 6-124C63	3.9k (1-freq. only)
R61	6-124A63	1.3k (2-freq. only)
R62	6-124C39	390
R63	6-124A73	10k ± 5% (1-freq. only)
	or 6-124A63	1.3k ± 5% (2-freq. only
R65	6-124C73	10k
R66	6-124A49	1k ± 5%
R67	6-124C45	680
R68	6-124C45	680 (2-freq. only)
R69, 70	6-124C89	47k (2-freq. only)
R81	6-124B24	1.2M ± 5%
R82	6-124C41	470
R83	6-124A43	560 ± 5%
R84	6-124A83	27k ± 5%
R85	6-124A79	18k ± 5%
R86	6-124A89	47k ± 5%
R87	6-124C77	15k
R90	6-124A78	16k ± 5%
R91	6-124A92	62k ± 5%
R92	6-124A43	560 ± 5%
R93	6-124C57	2.2k
R94	6-124A67	5.6k ± 5%
R95	6-124C89	47k
R96	6-124A11	27 ± 5%
R97	6-124C51	1.2k
		integrated circuit:
U1	51-84561L84	type M2078
U2	51-84621K80	type M2077
		voltage regulator:
VR1	48-82256C56	Zener type, 8.8 V
VR2	48-82256C50	Zener type, 13 V
		crystal: (see note 2)
Y1, 2	KXN6122AA	46.700 — 54.433 MHz (1 and 2 freq.)
	or KXN6122AH	41.7666 — 46.7000 MHz (1 and 2 freq.)
Y3, 4, 5	48-84396K01	I-f; 10.7 MHz

non-referenced items

9-83487K01	SOCKET, crystal for Y1, Y2
26-83264F01	SHIELD, coil
26-84598A01	SHIELD, coil; large hole (for RF & OSC coil)
26-84598A02	SHIELD, coil; small hole (for I-f coil)
26-82570L01	HEATSINK (used with U2)
26-82571L01	HEATSINK (used with U2)
26-82570L01	HEATSINK: 1.20 x .90" (used with U2)
26-82571L01	HEATSINK: .59 x .32" (used with U2)

NOTE
Parts with an * indicate components that are also used with 25 W power amplifier models. All other 10 W power amplifier parts are deleted in 25 W models.

Power Amplifier, 10-Watt:
(p/o Unified Chassis In 10-Watt Models) — PL-3354-F

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±5%; 500 V: unless otherwise stated
C250L, M	20-83201B03	var; 20-115
C250H	20-83201B02	var; 8-60
C251*	21-83596E10	220 ± 20%; 500 V
C252	21-82372C04	.05 + 80-20%; 25 V
C252*	21-82372C10	.05 uF + 80-20%; 25 V (25 W models only)
C253	21-84494B36	13
C254	20-83201B02	var; 8-60
C255L, M	21-83406D79	18; N150
C255H	21-83406D97	15; NP0
C256L, M	21-83406D82	36; NP0
C256H	21-83406D69	30; NP0
C257L, M	21-83406D71	33; NP0
C257H	21-83406D68	27; NP0
C258L, M	21-83406D79	18; N150
C258H	21-83406D97	15; NP0
C259L	21-82204B58	20; NP0
C259M, H	21-83406D79	18; N150
C260*	21-82204B06	100 ± 10%; 500 V
	or 21-83596E10	220 ± 10%; (25 W models only)
C261L	21-82204B58	20; NP0
C261M, H	21-93406D79	18; N150
C262*	23-84538G04	15 uF
C263	21-867845	3 ± .5
C264	21-83596E10	220 ± 20%; (10 W models only)
		diode: (see note)
CR250	48-83510F04	silicon
		coil, rf:
L250	24-83977B01	1-1/2 turns
L251L, M, H	24-84346A02	choke; 230 nH
L252	24-83884G06	4-1/2 turns; coded WHT
L253	24-83884G04	7-1/2 turns; coded YEL
L254L, M	24-83884G09	6-1/2 turns; coded BLU
L254H	24-83884G08	5-1/2 turns; coded ORG
L255L, M	24-83884G09	6-1/2 turns; coded BLU
L255H	24-83884G08	5-1/2 turns; coded ORG
L256L, M	24-83884G09	6-1/2 turns; coded BLU
L256H	24-83884G08	5-1/2 turns; coded ORG
L257, L257L	24-83884G09	6-1/2 turns; coded BLU
L257M, H	24-83884G08	5-1/2 turns; coded ORG
		transistor: (see note)
Q250	48-869680	NPN; type M9860
		resistor, fixed: ± 10%; 1/4 W: unless otherwise stated
R158L	6-126C27	120; 1 W
R250	6-124C25	100
R251	6-125C47	820; 1/2 W
R252	6-124C63	2.9k
R253*	6-124D55	2.7
R254L	6-125C01	10; 1/2 W
R254M, H	6-125C07	18; 1/2 W

non-referenced item

26-84716D01	HEATSINK

Exciter (p/o Unified Chassis) — PL-3352-H

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±5%; 500 V; unless otherwise stated
C101	21-83596E10	220 ± 20%
C102, 103	8-82905G08	.033 uF ± 10%; 50 V
C104, 105	21-83596E10	220 ± 20%
C106	8-82905G10	.015 uF ± 10%; 50 V
C107	21-82428B15	.005 uF
C108	8-82905G21	.018 uF ± 10%; 100 V
C109	21-82187B18	.0015 uF ± 10%; 100 V
C110	23-84665F01	10 uF + 100-10%; 25 V
C111	21-850510	470 ± 10%; 300 V
C112L, M	21-82204B51	62; N220
C112H	21-82610C21	62; N220
C113	21-84494B52	91
C114	21-84494B15	300
C115, 116	21-82428B59	.01 uF + 80-20%; 200 V
C117L	21-82204B29	43
C117M	21-82133G39	36; N150
C117H	21-82133G75	30; N150
C118L	21-82450B16	0.62
C118M, H	21-82450B29	.51
C119L	21-82133G35	56; NP0
C119M	21-83406D18	47
C119H	21-82133G39	36
C120	21-863147	150
C121	21-82187B20	.001 uF ± 10%; 100 V
C122	21-82450B10	4.3
C123	21-83596E10	220 ± 20%
C124, 125, 126	21-82428B59	.01 uF + 80-20%; 200 V
C127L	21-82610C29	51
C127M	21-82610C03	47
C127H	21-83406D42	43
C128L	21-82187B08	220
C128M	21-863147	150
C128H	21-82610C44	100; 100 V
C129L	21-859942	220; 100 V
C130	23-84538G04	15 uF
C131L	21-82133G01	10
C131M	21-82133G22	8 ± .5 pF; NP0
C131H	21-82133G26	6 ± .5 pF; NP0
C132L	21-859942	220; 100 V
C133L	21-82450B16	0.62
C133M, H	21-82450B29	.51
C134L	21-82989E31	14
C134M	21-82133G21	10 ± .5 pF; NP0
C134H	21-82133G22	8 ± .5 pF; NP0
C135	21-82133G41	4.7 ± .25 pF; NP0
C136	21-82204B06	100 ± 10%; N1500
C137	21-82372C04	.05 uF + 80-20%; 25 V
C138L, M	21-83406D69	30
C138H	21-83406D81	20
C139	20-83201B02	var; 8-60 pF
C140	21-84494B32	20 (10 W only)
	or 21-83566E10	220 (25 W only)
C141L	21-859942	220; 100 V
C142	23-84665F01	10 uF + 100-0%; 35 V
C143	23-84465F01	10 uF + 100-10%; 25 V (2-freq. only)
C144	21-850510	470 ± 10%; 300 V (2-freq. only)
C145L, M	21-82204B51	62; N330 (2-freq. only)
C145H	21-82610C21	62; N220 (2-freq. only)
C146	21-84494B52	91 (2-freq. only)
C147	21-84494B15	300 (2-freq. only)
C148	21-82428B59	.01 uF + 80-20%; 200 V (2-freq. only)
C150	21-83596E10	220 ± 20%
C151	21-82372C04	.05 uF + 80-20%; 25 V
C152	21-83596E10	220 ± 20%
C153L, M	21-83406D70	8 ± .25; NP0 (10 W only)
C153H	21-83406D84	6.8; NP0 (10 W only)
C154L	21-84494B31	19; 500 V
C154M, H	21-84494B36	13 (25 W only)
C155	21-83596E10	220 ± 20%
C156	21-82372C04	.05 uF + 80-20%; 25 V
C157	21-871966	5 (25 W only)
C159L	21-82428B47	.02 uF (25 W only)
		diode: (see note)
CR101	48-82190H53	varactor
CR102	48-82190H53	varactor (2-freq. only)
CR103	48-83654H01	silicon
CR104	48-83654H01	silicon (2-freq. only)
CR105	48-82139G01	germanium
CR106, 107	48-83654H01	silicon
		coil, rf:
L101L	24-84922C09	21-1/2 turns
L101M, H	24-83601K01	18-1/2 turns
L102	24-84972A06	8-1/2 turns; coded ORG
L103	24-84972A04	8-1/2 turns; coded WHT
L104	24-82835G13	0.82 uH
L105	24-84972A05	8-1/2 turns; coded RED
L106	24-82835G13	0.82 uH
L107	24-84972A26	3-1/2 turns; coded BLU
L108	24-84972A11	3-1/2 turns
L109	24-800484	0.31 uH

LA D.	DESCRIPTION
	capacitor, fixed: pF ± 5%; 500 V; unless otherwise stated
0	220 ± 20%
3	.033 uF ± 10%; 50 V
0	220 ± 20%
0	.015 uF ± 10%; 50 V
15	.005 uF
1	.018 uF ± 10%; 100 V
18	.0015 uF ± 10%; 100 V
01	10 uF + 100-10%; 25 V
	470 ± 10%; 300 V
51	62; N220
21	62; N220
52	91
15	300
59	.01 uF + 80-20%; 200 V
29	43
39	36; N150
375	30; N150
B16	0.62
B29	.51
G35	56; NP0
D18	47
G39	36
7	150
7B20	.001 uF ± 10%; 100 V
0B10	4.3
5E10	220 ± 20%
8B59	.01 uF + 80-20%; 200 V
0C29	51
0C03	47
6D42	43
7B08	220
47	150
0C44	100; 100 V
942	220; 100 V
38G04	15 uF
33G01	10
33G22	8 ± .5 pF; NP0
33G26	6 ± .5 pF; NP0
942	220; 100 V
50B16	0.62
50B29	.51
89E31	14
133G21	10 ± .5 pF; NP0
133G22	8 ± .5 pF; NP0
133G41	4.7 ± .25 pF; NP0
204B06	100 ± 10%; N1500
372C04	.05 uF + 80-20%; 25 V
406D69	30
406D81	20
201B02	var; 8-60 pF
494B32	20 (10 W only)
83566E10	220 (25 W only)
9942	220; 100 V
665F01	10 uF + 100-0%; 35 V
465F01	10 uF + 100-10%; 25 V (2-freq. only)
0510	470 ± 10%; 300 V (2-freq. only)
204B51	62; N330 (2-freq. only)
610C21	62; N220 (2-freq. only)
494B52	91 (2-freq. only)
494B15	300 (2-freq. only)
428B59	.01 uF + 80-20%; 200 V (2-freq. only)
596E10	220 ± 20%
372C04	.05 uF + 80-20%; 25 V
596E10	220 ± 20%
406D70	8 ± .25; NP0 (10 W only)
406D84	6.8; NP0 (10 W only)
494B31	19; 500 V
494B36	13 (25 W only)
596E10	220 ± 20%
372C04	.05 uF + 80-20%; 25 V
1966	5 (25 W only)
428B47	.02 uF (25 W only)
	diode: (see note)
190H53	varactor
190H53	varactor (2-freq. only)
654H01	silicon
654H01	silicon (2-freq. only)
139G01	germanium
654H01	silicon
	coil, rf:
922C09	21-1/2 turns
601K01	18-1/2 turns
972A06	8-1/2 turns; coded ORG
972A04	8-1/2 turns; coded WHT
835G13	0.82 uH
972A05	8-1/2 turns; coded RED
835G13	0.82 uH
372A26	3-1/2 turns; coded BLU
372A11	3-1/2 turns
0484	0.31 uH

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L110	24-83884G01	3-1/2 turns
L112	24-800484	0.31 uH
L113L	24-83884G09	6-1/2 turns
L113M	24-83884G07	2-1/2 turns; coded GRN (10-watt)
L113H	24-83884G03	1-1/2 turns; coded BRN (10-watt)
L114	24-83601K01	18-1/2 turns; 2-freq. only
L115L	24-83977B02	choke 2-1/2 turns; 25-watt models — same location as R130
		transistor: (see note)
Q100	48-869643	PNP; type M9643
Q101, 102	48-869642	NPN; type M9642
Q103, 104, 105	48-869494	NPN; type M9494
Q106	48-869657	NPN; type M9657
Q107	48-869859	NPN; type M9859
Q108	48-869494	NPN; type M9494
Q109	48-869643	PNP; type M9643
Q110	48-869649	PNP; type M9649
Q111, 112	48-869643	PNP; type M9643
Q113	48-869640	NPN; type M9640
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R101	6-124C43	560 ± 10%
R102	6-124A83	27k
R103	6-124A93	68k
R104	6-124A83	27k
R105	6-124A93	68k
R106	6-124A26	110
R108	6-124A57	2.2k
R109, 110	6-124A67	5.6k
R111	6-124A69	6.8k
R112	6-124A73	10k
R113	6-124A71	8.2k
R114	6-124C59	2.7k ± 10%
R115	18-84944C02	var; 25k
R116	6-124C67	5.6k ± 10%
R117	6-124B02	150k
R118	6-124B04	180k
R119	6-124A65	4.7k
R120	6-124A75	12k
R121	6-124A49	1k
R122	6-124A67	5.6k
R123	6-124A73	10k
R124	6-124A19	56
R125	6-124C37	330 ± 10%
R126, 127	6-124C33	220 ± 10%
R128	6-124A27	120
R129	6-124C63	3.9k
R130	6-124C25	100 ± 10%
R131	18-84944C02	var; 25k
R132	6-124C67	5.6k ± 10% (2-freq. only)
R133	6-124B02	150k; (2-freq. only)
R134	6-124B04	180k; (2-freq. only)
R135	6-124A65	4.7k; (2-freq. only)
R136	6-124C75	12k ± 10%; (2-freq. only)
R137	6-124A49	1k; (2-freq. only)
R138	6-124C17	47 ± 10%
R139	6-124D61	4.7 ± 10%
R140	18-84944C04	variable; 500
R141	6-124C35	270 ± 10%
R142	6-125C29	150 ± 10%; 1/2 W
R143	6-125C47	820 ± 10%; 1/2 W
R144	6-124A53	1.5k
R145	17-82036G48 or 17-82036G49	0.1-5-2 W (10 W models) .05-5-2 W (25 W models)
R146	6-124A59	2.7k
R147	6-124C49	1k ± 10%
R148, 149	6-124A69	6.8k
R150	6-124C49	1k ± 10%
R151	6-124A26	110
R152	6-124C01	10 ± 10%
R153	6-125A25	100 ± 5%; 1/2 W
R154	6-124A85	33k
R155	6-125C53	1.5k ± 10%
R159L	6-125C25	100 ± 10%; 1/2 W (25 W models)
		thermistor:
RT101	6-83600K01	1k @ 25 °C
		voltage regulator:
VR101	48-82256C56	Zener type: 8.8 V
		crystal: (see note 2)
Y101, 102	KXN6121AA or KXN6121AG	16.7555-19.3333 MHz (1 & 2 freq.) 15.111-16.7555 MHz (1 & 2 freq.)

non-referenced items

	9-83487K01	SOCKET, for Y101, Y102
	26-84598A01	SHIELD, coil
	76-83960B01	FERRITE BEAD (small)
	76-84069B02	FERRITE BEAD (large)

TRN6209A Installation Kit — PL-5036-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	7-83131K01	TRUNNION
	3-138021	SCREW, tapping: 10-16 x 3/4"; 6 used
	3-139966	SCREW, machine: 10-32 x 1/2"; 2 used

TMN6104A Microphone — PL-3351-D

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		cartridge, microphone:
DP601	59-82933C02 or 59-82933C01	preamplifier dynamic: includes transistor
		cord, microphone; coiled:
W601	1-80778B38	Includes:
	39-10184A24	TERMINAL, PIN, female (4 req'd.)
	29-83277G04	LUG; 8 req'd.
	30-82565B34	CABLE, coiled; 4 conductor
		switch, push:
S604	40-82263G02	dpst

non-referenced items

	33-82599D04	NAMEPLATE
	13-84599B02	EMBLEM
	38-84559B03	PUSHBUTTON
	3-140000	SCREW, tapping: No. 6-19 x 3/4"; 3 req'd.
	1-80710D23	HOUSING, microphone (rear)
	42-852710	STRAP, strain relief
	3-139999	SCREW, tapping: No. 6-19 x 3/8"; 3 req'd.
	15-82662M23	COVER, microphone (front)
	42-82702B02	RETAINER, cartridge
	32-82703B01	GASKET, neoprene
	41-852707	SPRING, strain relief
	37-84333M01	MICROPHONE, strain relief

TMN6104B Microphone — PL-6843-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ± 20%; 600 V: unless otherwise stated:
C1	21-82610C14	30 ± 5%; 200 V
C2	21-859601	1000
C3	23-84669A24	1 uF + 150-10%; 25 V
C4	21-82610C14	30 ± 5%; 200 V
C5	21-859601	1000
C6	8-82096J04	.047 uF ± 10%; 250 V
C7	21-82187B08	220 ± 10%; 500 V
C8	21-859601	1000
		preamplifier assembly:
DP601	1-80724D70	note: Detail parts of the preamplifier assembly are included in this parts list
		cartridge, microphone:
MK1	50-82825M01	electret-condenser
		transistor: (see note)
Q1	48-869642	NPN; M9642
		resistor, fixed: ± 10%; 1/4 W: unless otherwise otherwise stated:
R1	6-124C57	2.2k
R2	6-124C97	100k
R3	6-124A19	56 ± 5%
		switch, microphone:
S604	40-82263G02	dpst
		diode: (see note):
VR1	48-82256C38	Zener; 9.1 V ± 5%
		cord assembly, microphone:
W601	1-80778B38	includes:
	29-83277G04	LUG, terminal: 8 used
	30-82565B34	CORD, coiled: 4-conductor
	39-10184A24	CONTACT, receptacle

non-referenced items

	1-80710D23	HOUSING ASSEMBLY, rear
		includes:
	4-82705B01	WASHER, back-up: .261 x 1.120 x .050"
	4-82707B01	WASHER, flat: .265 x 1.360 x .034"
	15-82662M13	HOUSING, rear
	1-80724D39	WIRE & LUG ASSEMBLY
		includes:
	29-82713M01	TERMINAL, contact
	3-135102	SCREW, machine: 4-40 x 1/4"; 2 used
	3-139999	SCREW, tapping: 6-19 x 3/8"; 3 used
	3-140000	SCREW, tapping: 6-19 x 3/4"; 3 used
	5-10115A42	GROMMET, rubber: .406" ID
	13-84599B02	EMBLEM
	15-82662M23	HOUSING, front
	15-82896M01	HOUSING, microphone adapter
	32-82703B01	GASKET, microphone
	33-82599D06	NAMEPLATE
	35-82652K01	BAFFLE, microphone
	38-84559B03	BUTTON, microphone
	37-84333M01	STRAIN RELIEF, microphone
	42-852710	STRAP, mounting

note: For optimum performance, replacement diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

REVISIONS

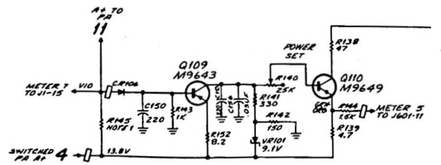
68P81013E37-D (Sheet 1 of 2)

CHASSIS AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION	REFER TO CIRCUIT BOARD
TUD1892AB TUD1893AB TUD1902AH TUD1903AH TUD1912AB TUD1913AB TUD1922AH TUD1923AH	CR107	ADDED 48-83654H01	BUFFER CIRCUIT	MAIN CIRCUIT BD. DETAIL PEPS-17222-B
	C157	ADDED 21-871966, 5 pF	EXCITER OUTPUT 10-WATT PWR. AMPL.	
	C264	ADDED 21-83596E10, 220 pF		
	R254	ADDED 6-125C07, 18		
		EXTENSIVE PARTS LIST CHANGES		
TUD1892AB-1 TUD1893AB-1 TUD1902AH-1 TUD1903AH-1 TUD1912AB-1 TUD1913AB-1 TUD1922AH-1 TUD1923AH-1	C10M	FROM 21-83406D89 TO 21-84713A30	PARTS LIST	PEPS-20241-O
	C10H	FROM 21-82133G79, 8.2 pF TO 21-84713A35, 9 pF		
	C11H	FROM 21-83406D71, 33 pF; NP0 TO 21-82133G83, 33 pF; N150		
	C13M	FROM 21-83406D02, 5 pF TO 21-84493B40, 6.8 pF		
	C13H	FROM 21-82610G36, 4 pF TO 21-863466, 5 pF		
	C14	FROM 21-82204B06, 100 pF TO 21-82877B15, 120 pF		
	C15M	FROM 21-82610C02, 43 pF TO 21-82240K05, 50 pF		
	C15H	FROM 21-859474, 36 pF TO 21-84713A31, 43 pF		
	C16M	FROM 21-82133G79, 8.2 pF TO 21-84713A35, 9 pF		
	C16H	FROM 21-82133G76, 6.8 pF TO 21-84713A46, 7 pF		
	C17	FROM 21-82450B01, 0.3 pF TO 21-842041, 0.36 pF		
	C42	FROM 21-82610C69, 110 pF TO 21-82358G12 100 pF		
	C70	FROM 21-82633G03, 100 pF TO 21-82877B36, 250 pF		
	C92	FROM 21-82989E11, 4 pF TO 21-83406D76, 3.9 pF		
	L18	FROM 24-84419D02 TO 24-84419D04		
	L21, 22	FROM 24-82835G20, 9.3 uH TO 24-82723H07, 10 uH		
	L61	FROM 24-83601K01, 18-1/2 turns TO 24-84922C09, 21-1/2 turns for 10-watt models		
	R34	FROM 6-124C69, 6.8K ±10% TO 6-124A69, 6.8K ±5%		
	R36	FROM 6-124C39, 390 ±10% TO 6-124A39, 390 ±5%		
	R65	ADDED 6-124C73, 10K		
	C112, 145 C112M, 145M C112H, 145H	FROM 21-855997, 62 pF; N330 TO 21-82204B51, 62 pF; N330 21-82610C21, 62 pF; N220		
	C140	FROM 21-83406D42, 43 pF TO 21-84494B32, 20 pF FOR 10-WATT MODELS		
	R140	FROM 18-84944C02, 25K TO 18-84944C04, 500		
	R141	FROM 6-124C37, 330 TO 6-124C35, 270		
	R143	FROM 6-124C49, 1K, 1/4 W TO 6-125C47, 820; 1/2 W		

REVISIONS

68P81013E37-D (Sheet 2 of 2)

CHASSIS AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
		DRIVE REGULATOR CIRCUIT WAS AS SHOWN BELOW:	



TRN6177B-1	Q406	FROM 48-869642 TO 48-869528	PTT DELAY CIRCUIT
	R425	FROM 6-124C93, 68k ±10%; 1/4 W TO 6-124C83, 27k ±10%; 1/4 W	Q406 BASE
	R427	FROM 6-124C79, 82k ±10%; 1/4 W TO 6-124C79, 18k ±10%; 1/4 W	Q405 BASE
	R449	FROM 6-124C93, 68k ±10%; 1/4 W TO 6-124C73, 10k ±10%; 1/4 W	
	R431	FROM 6-124C95, 82k ±10%; 1/4 W TO 6-124C61, 3.3k ±10%; 1/4 W	Q407 EMITTER
	VR101	FROM 48-82256C43 ZENER 9.1 V TO 48-82256C56 ZENER 8.8 V	VR101
TRN6177B-2	C440	23-84665F04 1.0 uF	
TRN6177C		REPLACES MODEL TRN6177B	

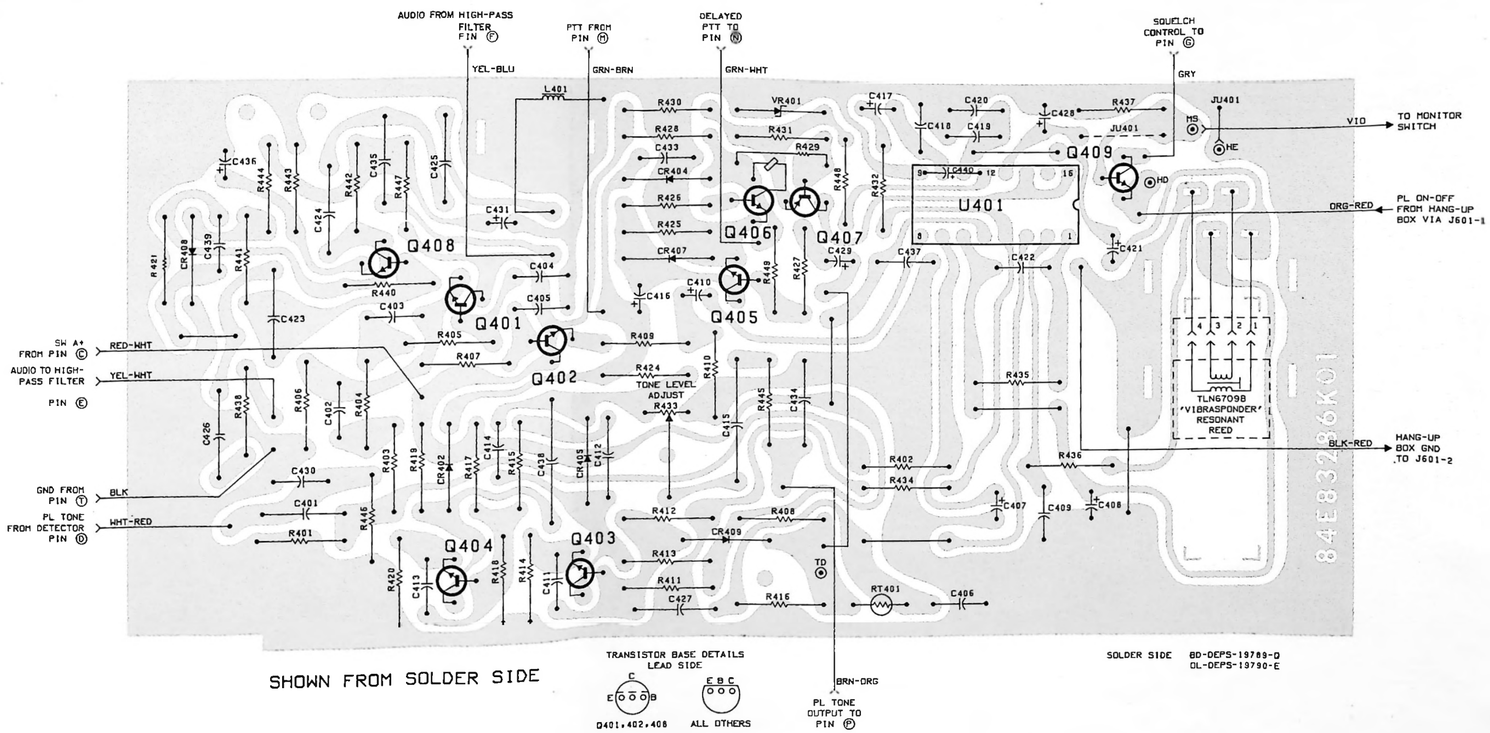
NES

parts list

TRN6177B/C *Private-Line* Encoder/Decoder — PL-3340-M

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed uF ± 10%; 100 V: unless otherwise stated
C401	8-82096J18	0.1 ± 10%; 250 V
C402, 403	21-83596E09	.01 + 80-20%; 200 V
C404	21-82428B23	.0012
C405	21-83596E09	.01 + 80-20%; 200 V
C406	21-83596E10	220 pF ± 20%; 500 V
C407, 408	23-84665F01	10 + 100-0%; 25 V
C409	21-83596E23	.0047; 200 V
C410	23-84665F01	10 + 100-0%; 25 V
C411	21-83596E10	220 pF ± 20%; 500 V
C412	8-82096J18	0.1 ± 10%; 250 V
C413, 414	21-83596E10	220 pF ± 20%; 500 V
C415	8-82096J20	0.22; 250 V
C416	23-84665F01	10 + 100-0%; 25 V
C417	23-84665F04	1 + 150-0%; 50 V
C418, 419	21-83596E23	.0047; 200 V
C420	21-83596E10	220 pF ± 20%; 500 V
C421	23-84665F01	10 + 100-0%; 25 V
C422	21-83596E10	220 pF ± 20%; 500 V
C423, 424	8-84496D04	.047 ± 20%; 100 V
C425	8-82905G31	0.15; 50 V
C426	8-84496D04	.047 ± 20%; 100 V
C427	8-82096J18	0.1 ± 10%; 250 V
C428	23-84665F01	10 + 100-0%; 25 V
C429	23-84665F04	1 + 150-0%; 50 V
C430	21-83596E09	.01 + 80-20%; 200 V
C431	23-84665F04	1 + 150-0%; 50 V
C433	21-83596E10	220 pF ± 20%; 500 V
C434	8-84637L06	.0068 ± 5%; 630 V
C435	8-84496D04	.047 ± 20%; 100 V
C436	23-84665F01	10 + 100-0%; 25 V
C437	21-83596E10	220 pF ± 20%; 500 V
C438	8-82096J20	0.22; 250 V
C439	21-82428B28	.002
C440	23-84665F04	1.0 + 150-0%; 50 V
		diode: (see note)
CR401		NOT USED
CR402	48-83654H01	silicon
CR404	48-82178A06	germanium
CR405, 407, 408, 409	48-83654H01	silicon
		coil:
L401	25-82498H02	6 H
		transistor: (see note)
Q401, 402	48-134667	NPN; type M54
Q403 thru 405	48-869642	NPN; type M9642
Q406	48-869528	NPN; type M9528
Q407	48-869643	PNP; type M9643
Q408	48-134667	NPN; type M54
Q409	48-869642	NPN; type M9642
		resistor, fixed: ± 10%; 1/4 W: unless otherwise stated
R401, 402	6-124D02	150k
R403, 404, 405	6-124A99	120k ± 5%
R406	6-124D02	150k
R407	6-124A99	120k ± 5%
R408	6-124C49	1k
R409	6-124C69	6.8k
R410	6-124C63	3.9k
R411	6-11009D02	150k ± 5%
R412	6-124C85	33k
R413	6-124C55	1.8k
R414	6-124C37	330
R415	6-124C93	68k
R416	6-124C65	4.7k
R417	6-124A99	120k ± 5%
R418	6-124C85	33k
R419	6-124C55	1.8k
R420	6-124C37	330
R421	6-124C87	22k
R424	6-124C67	5.6k
R425	6-124A73	10k ± 5% (TRN6177C)
	6-124C83	27k (TRN6177B)
R426	6-124C73	10k
R427	6-124C79	18k
R428	6-124C49	1k
R429	6-124C83	27k
R430	6-124C33	220
R431	6-124C61	3.3k
R432	6-124C57	2.2k
R433	18-84944C02	variable; 25k
R434	6-124C53	1.5k
R436	6-124C45	680
R437	6-124C97	100k
R438	6-124C73	10k
R440	6-124D02	150k
R441	6-124C89	47k
R442	6-124C97	100k
R443, 444	6-124C73	10k
R445	6-124C77	15k
R446	6-124C85	33k
R447	6-124C49	1k
R448	6-124C97	100k
R449	6-124C73	10k
R450	6-124A61	3.3k ± 5% (TRN6177C only)
		thermistor:
RT401	6-82990E18	190 ohms
		integrated circuit: (see note)
U401	51-80074C02	type 74C02
		diode: (see note)
VR401	48-82256C25	Zener type; 12 V
		non-referenced items
	KLN6209A	*VIBRASPONDER*, resonant reed
	42-84116B02	SOCKET, *Vibrasponder*
	39-10184A10	CONTACT, push-pin; male
	39-10184A24	CONTACT, push-pin; female: 9 req'd.
	29-84706E06	PIN, female

note: For optimum performance, replacement diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.



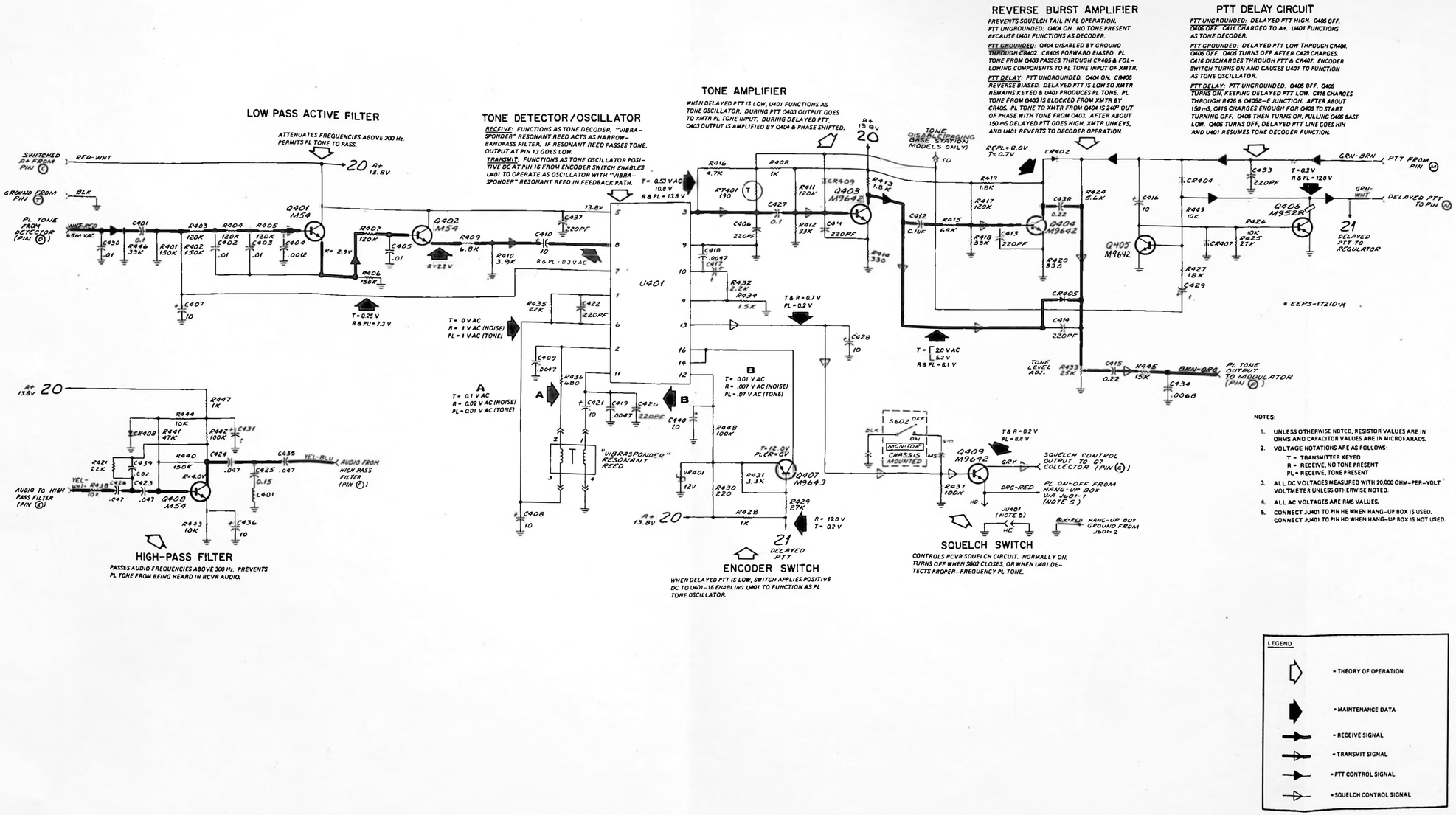
SHOWN FROM SOLDER SIDE

TONE *PRIVATE-LINE* ENCODER/DECODER

MODEL TRN6177C

FUNCTION

Encodes and decodes sub-audible *Private-Line* tones. Encoder modulates transmitter and delays transmitter turn-off 150 ms to allow transmission of turn-off reverse tone burst. Decoder detects received tone and unsquelches receiver when proper tone is received.


LOW PASS ACTIVE FILTER
ATTENUATES FREQUENCIES ABOVE 200 Hz. PERMITS PL TONE TO PASS.
TONE DETECTOR/OSCILLATOR
RECEIVE: FUNCTIONS AS TONE DECODER. "VIBRA-SPONDER" RESONANT REED ACTS AS NARROW-BANDPASS FILTER. IF RESONANT REED PASSES TONE, OUTPUT AT PIN 13 GOES LOW.
TRANSMIT: FUNCTIONS AS TONE OSCILLATOR POSITIVE DC AT PIN 16 FROM ENCODER SWITCH ENABLES U401 TO OPERATE AS OSCILLATOR WITH "VIBRA-SPONDER" RESONANT REED IN FEEDBACK PATH.
TONE AMPLIFIER
WHEN DELAYED PTT IS LOW, U401 FUNCTIONS AS TONE OSCILLATOR. DURING PTT Q403 OUTPUT GOES TO XMTR PL TONE INPUT. DURING DELAYED PTT, Q403 OUTPUT IS AMPLIFIED BY Q404 & PHASE SHIFTED.
REVERSE BURST AMPLIFIER
PREVENTS SQUELCH TAIL IN PL OPERATION.
PTT UNGROUNDED: Q404 ON. NO TONE PRESENT BECAUSE U401 FUNCTIONS AS DECODER.
PTT GROUNDED: Q404 DISABLED BY GROUND THROUGH CR402. CR405 FORWARD BIASED. PL TONE FROM Q403 PASSES THROUGH CR405 & FOLLOWING COMPONENTS TO PL TONE INPUT OF XMTR.
PTT DELAY: PTT UNGROUNDED. Q404 ON. CR405 REVERSE BIASED. DELAYED PTT IS LOW SO XMTR REMAINS KEYED & U401 PRODUCES PL TONE. PL TONE FROM Q403 IS BLOCKED FROM XMTR BY CR405. PL TONE TO XMTR FROM Q404 IS 240° OUT OF PHASE WITH TONE FROM Q403. AFTER ABOUT 150 mS DELAYED PTT GOES HIGH, XMTR UNKEYS, AND U401 REVERTS TO DECODER OPERATION.
PTT DELAY CIRCUIT
PTT UNGROUNDED: DELAYED PTT HIGH. Q405 OFF. C416 OFF: C416 CHARGED TO A+. U401 FUNCTIONS AS TONE DECODER.
PTT GROUNDED: DELAYED PTT LOW THROUGH CR406. Q406 OFF. Q405 TURNS OFF AFTER C429 CHARGES. C416 DISCHARGES THROUGH PTT & CR407. ENCODER SWITCH TURNS ON AND CAUSES U401 TO FUNCTION AS TONE OSCILLATOR.
PTT DELAY: PTT UNGROUNDED. Q405 OFF. Q405 TURNS ON, KEEPING DELAYED PTT LOW. C416 CHARGES THROUGH R426 & CR406-E JUNCTION. AFTER ABOUT 150 mS, C416 CHARGES ENOUGH FOR Q405 TO START TURNING OFF. Q405 THEN TURNS ON, PULLING Q405 BASE LOW. Q405 TURNS OFF, DELAYED PTT LINE GOES HIGH AND U401 RESUMES TONE DECODER FUNCTION.
HIGH-PASS FILTER
PASSES AUDIO FREQUENCIES ABOVE 300 Hz. PREVENTS PL TONE FROM BEING HEARD IN RCVR AUDIO.
ENCODER SWITCH
WHEN DELAYED PTT IS LOW, SWITCH APPLIES POSITIVE DC TO U401-16 ENABLING U401 TO FUNCTION AS PL TONE OSCILLATOR.
SQUELCH SWITCH
CONTROLS RCVR SQUELCH CIRCUIT. NORMALLY ON. TURNS OFF WHEN S602 CLOSES, OR WHEN U401 DETECTS PROPER-FREQUENCY PL TONE.
SWITCHED B+ FROM PIN G
GROUND FROM PIN F
PL TONE FROM DETECTOR (PIN J)
AUDIO TO HIGH PASS FILTER (PIN B)
AUDIO FROM HIGH PASS FILTER (PIN E)
TONE DISABLE-STROBING BASE STATION (MODELS ONLY)
PTT FROM PIN M
DELAYED PTT TO PIN M
PL TONE OUTPUT TO MODULATOR (PIN D)
TONE LEVEL ADJ.
S602 OFF ON MONITOR CHASSIS MOUNTED
SQUELCH CONTROL OUTPUT TO Q7 COLLECTOR (PIN C)
PL ON-OFF FROM HANG-UP BOX VIA J601-1 (NOTE 5)
HANG-UP BOX GROUND FROM J601-2
J401 (NOTE 5)
"VIBRASPONDER" RESONANT REED
U401
Q401 M54
Q402 M54
Q403 M9642
Q404 M9642
Q405 M9642
Q406 M9528
Q407 M9643
Q408 M54
Q409 M9642
* EEPS-17210-H

NOTES:

1. UNLESS OTHERWISE NOTED, RESISTOR VALUES ARE IN OHMS AND CAPACITOR VALUES ARE IN MICROFARADS.
2. VOLTAGE NOTATIONS ARE AS FOLLOWS:
   T = TRANSMITTER KEYED
   R = RECEIVE, NO TONE PRESENT
   PL = RECEIVE, TONE PRESENT
3. ALL DC VOLTAGES MEASURED WITH 20,000 OHM-PER-VOLT VOLTMETER UNLESS OTHERWISE NOTED.
4. ALL AC VOLTAGES ARE RMS VALUES.
5. CONNECT JU401 TO PIN HE WHEN HANG-UP BOX IS USED. CONNECT JU401 TO PIN HD WHEN HANG-UP BOX IS NOT USED.

LEGEND

- = THEORY OF OPERATION
- = MAINTENANCE DATA
- = RECEIVE SIGNAL
- = TRANSMIT SIGNAL
- = PTT CONTROL SIGNAL
- = SQUELCH CONTROL SIGNAL

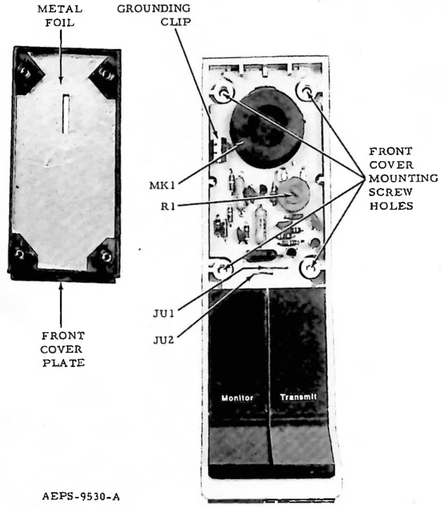
68P81029E99-P
2/1/81-PHI

DESK MICROPHONES

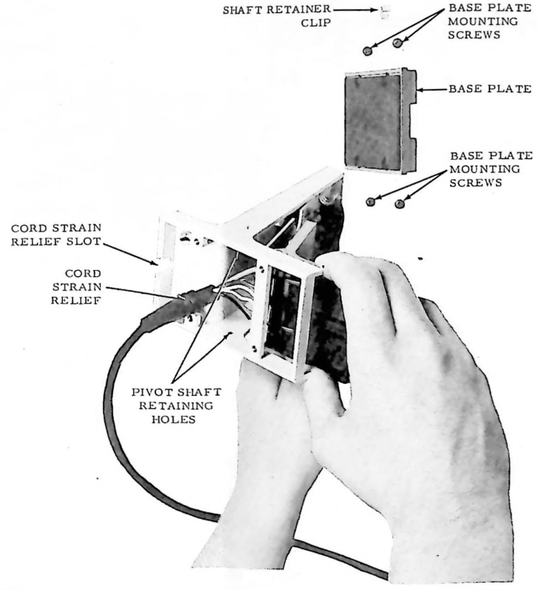
MODELS TMN1008A-TMN1011A
TMN1010A, TMN1021A, TMN1022A

FUNCTION

The desk microphones provide a desk surface self-supporting stand to mount the TRANSMIT and PL MONITOR switches and to support the dynamic cartioid microphone element at mouth level. The TMN1008A, TMN1010A and TMN1022A are used in "Private-Line" squelch systems and provide both TRANSMIT and MONITOR switches; the TMN1009A, TMN1011A and TMN1021A are used with carrier squelch systems and use only the TRANSMIT switch. The TMN1018A is used in paging applications and includes both TRANSMIT and MONITOR switches.



AEPS-9530-A



FAEPS-9528-O

MICROPHONE DETAIL

68P81030E06-J
2/1/81-PHI

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION

PARTS LIST

TRN6029A & TLN4925A Microphone Circuit Board PL-3510-O

		CAPACITOR, fixed: uF ±10%
C1	21-82187B08	220 pF; 500 V
C2	8-82987E11	.022; 80 V
C3	21-82187B44	.001; 100 V
C4	23-84762H09	15; ±20%; 20 V
C5	21-82187B44	.001; 100 V
C6	8-82987E02	.047; 200 V
C7	21-82187B45	470 pF; 500 V
		CARTRIDGE, microphone:
MK1	59-84640E01	miniature
		TRANSISTOR: (SEE NOTE)
Q1	48-869571	PNP; type M9571
Q2, 3	48-869594	NPN; type M9594
		RESISTOR, fixed: ±10%; 1/4 W; unl. stated
R1	18-83083G34	variable; 1.5 meg ±30%
R2	6-129226	100k
R3	6-127805	15k
R4	6-124B14	470k ±5%
R5	6-129668	10k ±5%
R7	6-129707	2.7k ±5%
R8	6-131858	270k ±5%
R9	6-129231	3.3k
R11	6-129753	100
NON-REFERENCED ITEMS		
	5-84371E01	GROMMET, cartridge
	42-84724E01	CLIP, grounding

THN6254A (PL), & THN6255A (Carrier Squelch), THN6320A (Paging)
Microphone Housing & Hardware Kit PL-3573-C

S1, 2	40-84711E03	SWITCH, leaf: assembly: S1 has 1 form A, 1 form B and 1 form C; S2 has 1 form A and 1 form B (THN6254A and THN6320A)
S1	40-84711E02	assembly: includes 1 form A and 1 form B (THN6255A)
NON-REFERENCED ITEMS		
	3-135676	SCREW, switch mtg. 4-40 x 1/4 pnl hex
	1-80779B59	CABLE ASSEMBLY includes: connector, 28-83372F02
	15-84186E01	COVER, front
	15-84188E01	COVER, rear
	15-84191E01	HOUSING
	26-84720E01	FOIL, grounding, front cover
	26-84721E01	FOIL, grounding, rear cover
	38-84184E02	BUTTON, plain (THN6255A)
	38-84184E01	BUTTON, "monitor" (THN6254A and THN6320A)
	38-84192E01	BUTTON, "transmit"
	42-84725E01	CLIP, retainer
	47-84193E01	SHAFT
	47-84194E01	SHAFT EXTENSION
	47-84723E01	SHAFT COUPLING (THN6255A only)
	22-82591C05	PIN, roll (THN6255A only)
	64-84183E01	PLATE, base
	75-84722E01	PAD, base plate; 4-40 x 5/16 phl bn hx black; 4 used
	3-138809	SCREW, baseplate; 4-40 x 5/8 phl bn hx black; 4 used
	3-138810	SCREW, front cover
	4-10058B10	WASHER, "Teflon" (THN6254A and THN6320A)

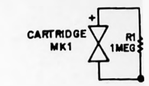
THN6252A (PL) & THN6253A (Carrier Squelch)
Microphone Housing & Hardware Kit PL-3511-D

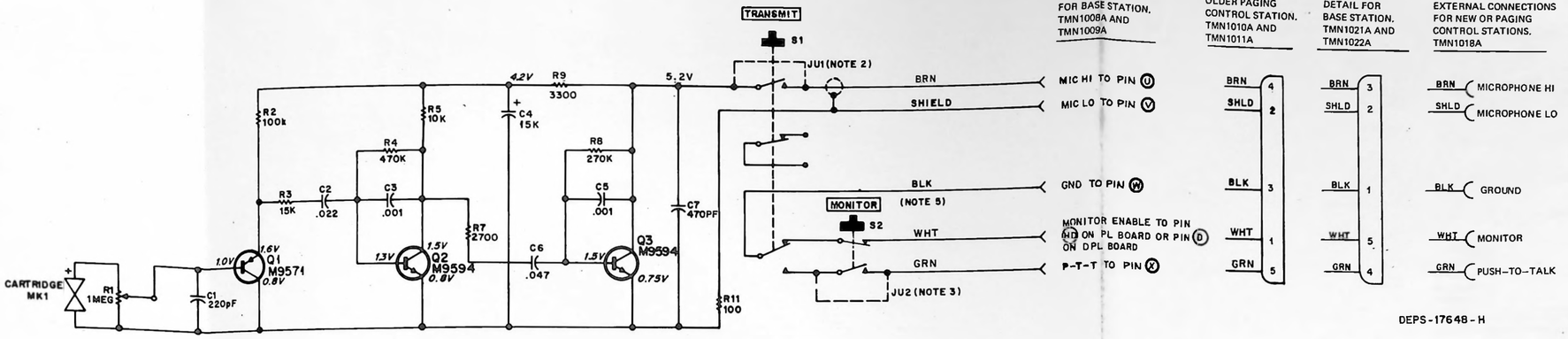
S1, 2	40-84711E03	SWITCH, leaf: assembly: S1 has 1 form A, 1 form B and 1 form C; S2 has 1 form A and 1 form B (THN6252A)
S1	40-84711E02	assembly: includes 1 form A, 1 form B and 1 form C (THN6253A)
NON-REFERENCED ITEMS		
	3-135676	SCREW, switch mtg. 4-40 x 1/4 pnl hex
	1-80780B29	CABLE ASSEMBLY includes: 39-10184A24 LUGS; 5 req'd.
	15-84186E01	COVER, front
	15-84188E01	COVER, rear
	15-84191E01	HOUSING
	26-84720E01	FOIL, grounding, front cover
	26-84721E01	FOIL, grounding, rear cover
	38-84184E02	BUTTON, plain (THN6253A)
	38-84184E01	BUTTON, "monitor" (THN6252A
	38-84192E01	BUTTON, "transmit"
	42-84725E01	CLIP, shaft retainer
	47-84193E01	SHAFT, pivot
	47-84194E01	SHAFT EXTENSION
	47-84723E01	SHAFT COUPLING (THN6252A) only)
	22-82591C05	PIN, roll (THN6252A only)
	64-84183E01	PLATE, base
	75-84722E01	PAD, base plate
	3-138809	BASE PLATE SCREW 4-40 x 5/16 phl bn hx bk ox
	3-138810	FRONT COVER SCREW 4-40 x 5/8 phl bn hx bk ox
	4-10058B10	WASHER ("TEFLON")

THN6370A (PL) & THN6371A (Carrier Squelch)
Microphone Housing & Hardware Kit PL-5933-A

		switch, leaf:
S1,2	40-84711E03	assembly: S1 has 1 form A, 1 form B and 1 form C; S2 has 1 form A and 1 form B (THN6370A)
S1	40-84711E02	assembly: includes 1 form A, 1 form B and 1 form C (THN6371A)
non-referenced items		
	3-135676	SCREW, switch mtg. 4-40 x 1/4 pnl hex; 3 used
	15-84186E01	COVER, front
	15-84188E01	COVER, rear
	15-84191E01	HOUSING
	26-84720E01	FOIL, grounding, front cover
	26-84721E01	FOIL, grounding, rear cover
	38-84184E02	BUTTON, plain (THN6371A)
	38-84184E01	BUTTON, "monitor" (THN6370A)
	38-84192E01	BUTTON, "transmit"
	42-84725E01	CLIP, shaft retainer
	47-84193E01	SHAFT, pivot
	47-84194E01	SHAFT EXTENSION
	47-84723E01	SHAFT COUPLING (THN6371A only)
	22-82591C05	PIN, roll (THN6371A only)
	64-84183E01	PLATE, base
	75-84722E01	PAD, base plate
	3-138809	SCREW, BASE PLATE 4-40 x 5/16 phl bn hx black; 4 used
	3-138810	SCREW, FRONT COVER 4-40 x 5/8 phl bn hx black; 4 used
	4-10058B10	WASHER ("TEFLON")(THN6370A)
	2-10101A57	NUT, spring; 2 used
	1-80708D78	CABLE ASSEMBLY includes:
	15-82062M01	HOUSING, plug
	28-82005M01	PLUG, microphone
	30-83560A02	CABLE; 6 conductor
	37-82575B01	SLEEVING, strain relief
	42-10217A02	STRAP, tie
	42-82061M01	CLIP, cable
	43-82063M01	COLLAR

NOTE: Replacement transistors must be ordered by Motorola part number only for optimum performance.





EXTERNAL CONNECTIONS FOR BASE STATION, TMN1008A AND TMN1009A

CONNECTOR DETAIL FOR OLDER PAGING CONTROL STATION. TMN1010A AND TMN1011A

BRN	4
SHLD	2
BLK	3
WHT	1
GRN	5

CONNECTOR DETAIL FOR BASE STATION, TMN1021A AND TMN1022A

BRN	3
SHLD	2
BLK	1
WHT	5
GRN	4

EXTERNAL CONNECTIONS FOR NEW OR PAGING CONTROL STATIONS. TMN1018A

BRN	MICROPHONE HI
SHLD	MICROPHONE LO
BLK	GROUND
WHT	MONITOR
GRN	PUSH-TO-TALK

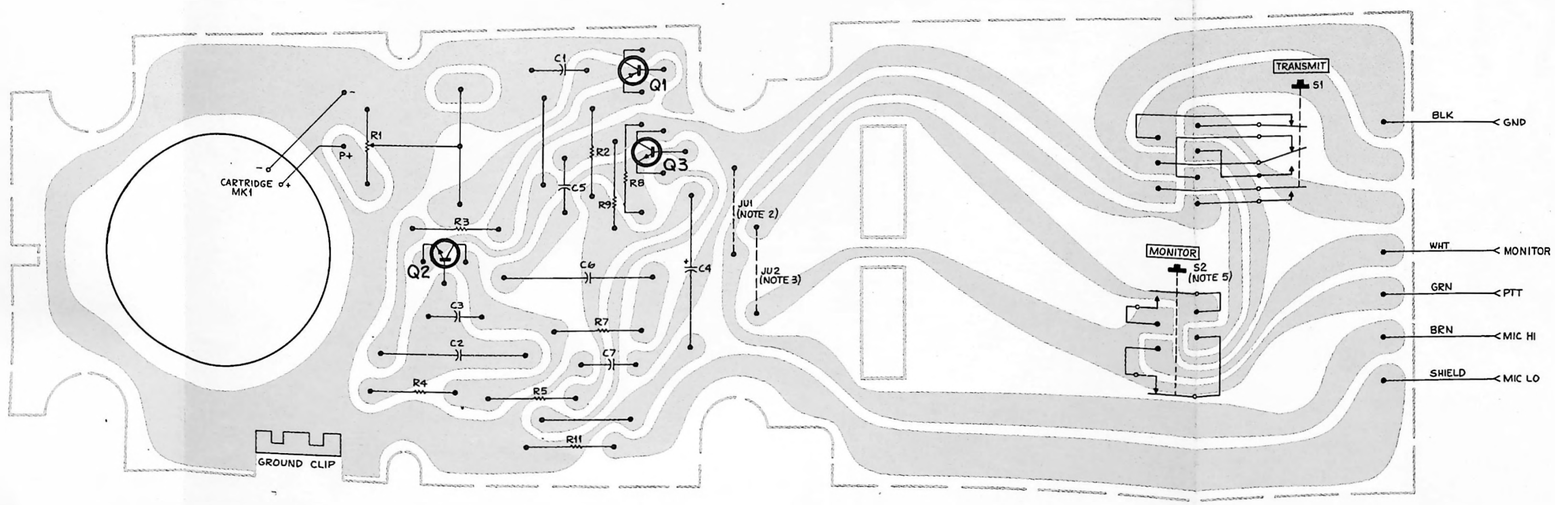
DEPS-17648-H

NOTES:

1. UNLESS OTHERWISE STATED ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. REMOVE JU1 FOR PARALLEL MIC OPERATION.
3. JU2 IS NORMALLY REMOVED TO ENSURE THAT THE OPERATOR MONITOR THE CHANNEL (FCC REQUIREMENT). IN THIS CASE BOTH THE MONITOR AND TRANSMIT BUTTONS MUST BE PRESSED TO TRANSMIT – RELEASING EITHER SWITCH ENDS THE TRANSMISSION.
4. ALL DC VOLTAGE READINGS ARE WITH RESPECT TO THE MIC LO LEAD.
5. MONITOR SWITCH S2 IS PRESENT IN MODELS TMN1008A, TMN1010A, TMN1018A, AND TMN1022A ONLY.

DESK MICROPHONE MODEL COMPLEMENT

TMN1008A	TMN1009A	TMN1010A	TMN1011A	TMN1018A	TMN1021A	TMN1022A	DESCRIPTION	VERSION
	1		1		1		TLN4925A MICROPHONE CIRCUIT BOARD	2
1		1		1		1	TRN6029A MICROPHONE CIRCUIT BOARD	0
1							THN6252A MICROPHONE HOUSING AND HARDWARE KIT	0
	1						THN6253A MICROPHONE HOUSING AND HARDWARE KIT	0
		1					THN6254A MICROPHONE HOUSING AND HARDWARE KIT	0
			1				THN6255A MICROPHONE HOUSING AND HARDWARE KIT	0
				1			THN6320A MICROPHONE HOUSING AND HARDWARE KIT	0
						1	THN6370A MICROPHONE HOUSING AND HARDWARE KIT	0
					1		THN6371A MICROPHONE HOUSING AND HARDWARE KIT	0



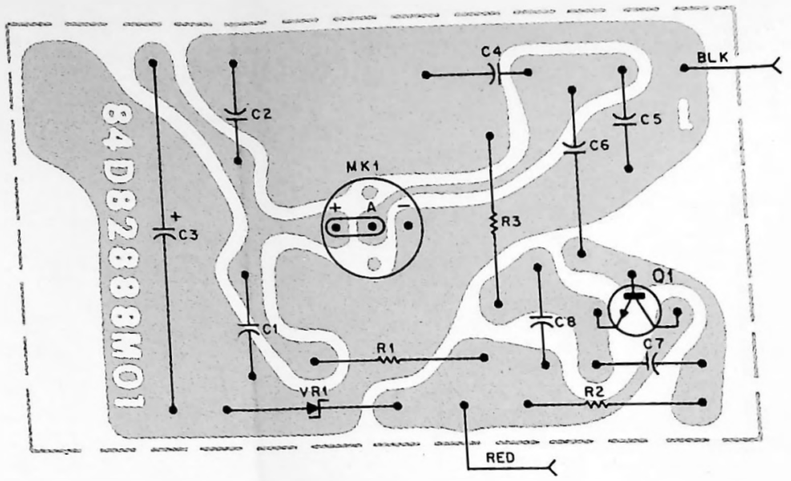
E B C
TRANSISTOR DETAIL

SHOWN FROM COMPONENT SIDE

OL-DEPS-17641-B

MICROPHONE PREAMPLIFIER

USED WITH MODEL TMN6104B MICROPHONE



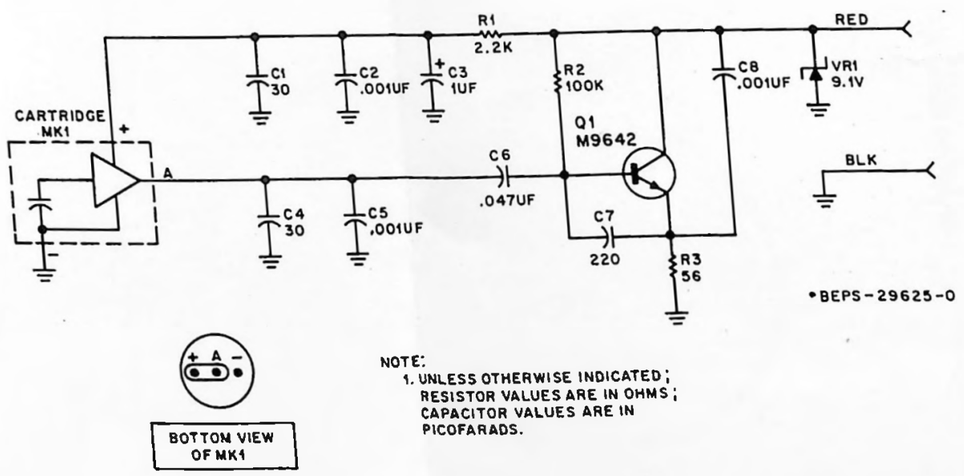
SHOWN FROM SOLDER SIDE

E B C

TRANSISTOR BASE DETAIL

SOLDER SIDE ○ BD-BEPS-29626-O
OL-BEPS-29627-O

CIRCUIT BOARD DETAIL



NOTE:
1. UNLESS OTHERWISE INDICATED; RESISTOR VALUES ARE IN OHMS; CAPACITOR VALUES ARE IN PICOFARADS.

PREAMPLIFIER SCHEMATIC DIAGRAM

MICROPHONE PREAMPLIFIER/DESK MICROPHONES

DIGITAL PRIVATE-LINE ENCODER-DECODER

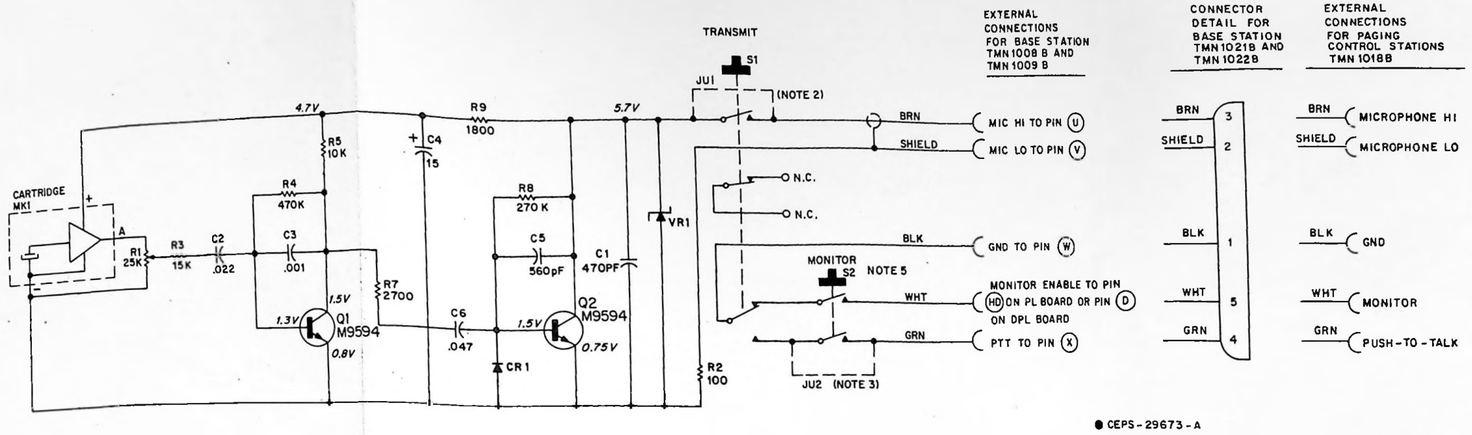
68P81044E74-A
2/1/81-PHI

DESK MICROPHONES

MODELS TMN1008B, TMN1009B, TMN1021B, TMN1022B, TMN1018B

FUNCTION

The desk microphones provide a desk surface self-supporting stand to mount the TRANSMIT and PL monitor switches and to support the electret condenser microphone element at mouth level. The TMN1008B, and TMN1022B are used in "Private-Line" squelch systems and provide both TRANSMIT and monitor switches; the TMN1009B, and TMN1021B are used with carrier squelch systems and use only the TRANSMIT switch. The TMN1018B is used in paging applications and includes both TRANSMIT and monitor switches.



● CEPS-29673-A

NOTES:

1. UNLESS OTHERWISE STATED: ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. REMOVE JU1 FOR PARALLEL OPERATION.
3. REMOVE JU2 TO MONITOR BEFORE TRANSMIT.
4. ALL DC VOLTAGE READINGS ARE WITH RESPECT TO THE MIC LO LEAD.
5. MONITOR SWITCH S2 IS PRESENT IN MODEL TMN1008B, TMN1018B, AND TMN1022B.

DESK MICROPHONE MODEL COMPLEMENT

TMN1008B	TMN1009B	TMN1018B	TMN1021B	TMN1022B	DESCRIPTION
X	X	X	X	X	TRN4315A MICROPHONE CIRCUIT BOARD
X		X		X	THN6404A MICROPHONE HOUSING AND HARDWARE KIT (PL AND DPL)
	X		X		THN6388A MICROPHONE HOUSING AND HARDWARE KIT (CARRIER SQUELCH)
X	X				TKN8093A CABLE KIT
		X			TKN8094A CABLE KIT
			X	X	TKN8095A CABLE KIT

parts list

THN6388A Housing &
THN6404A Housing &

REFERENCE SYMBOL	M F
S1	40-84
S1	40-84
	2-101
	3-135
	3-138
	3-140
	4-1005
	15-829
	15-829
	15-841
	22-825
	38-841
	38-841
	38-841
	42-8214
	42-8472
	47-8419
	47-8419
	47-8472
	64-8297
	75-8472

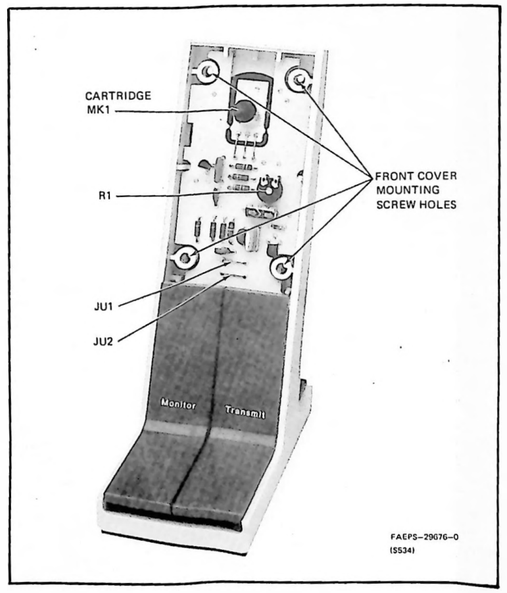


Figure 1. Microphone Detail

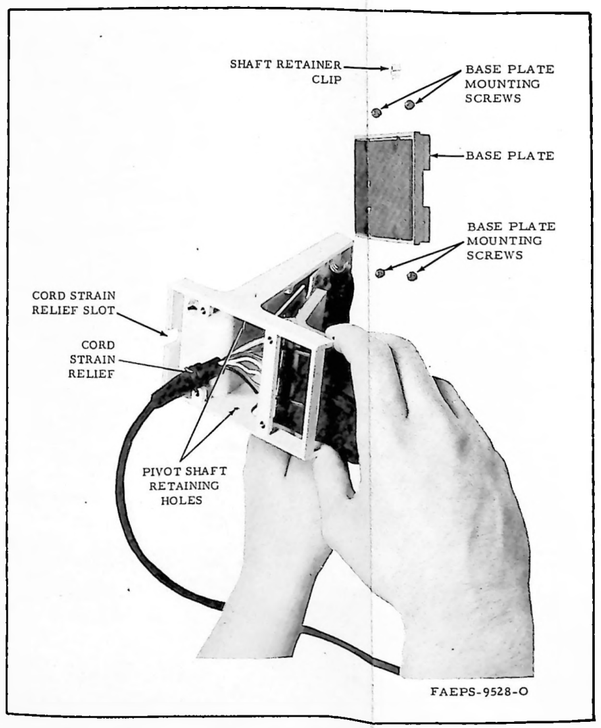
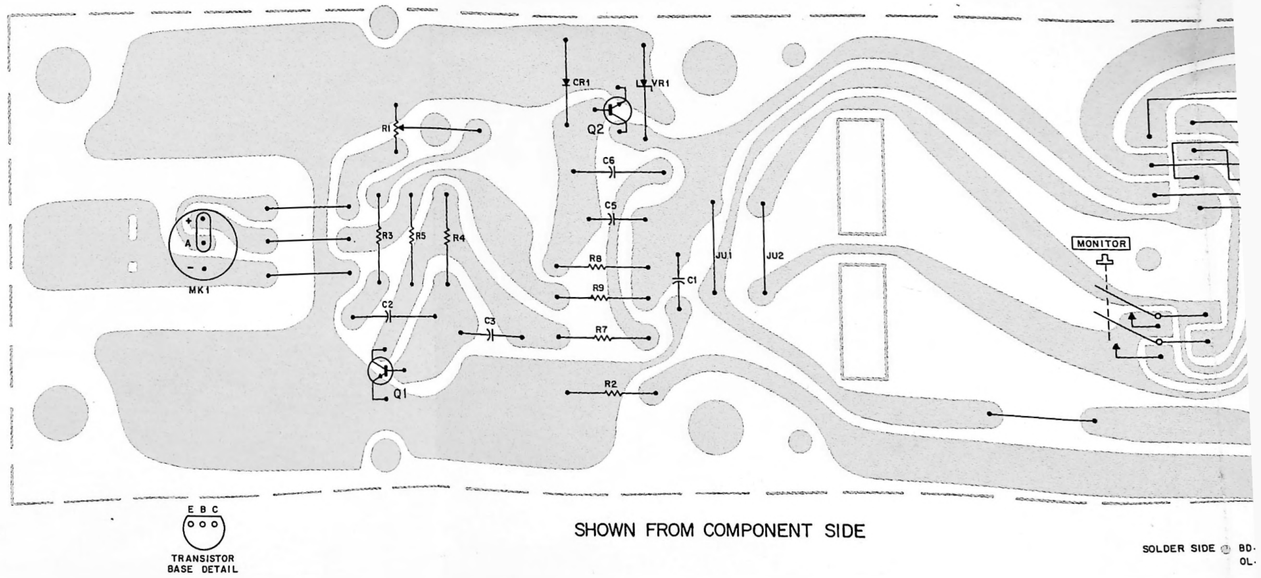


Figure 2. Microphone Assembly Detail



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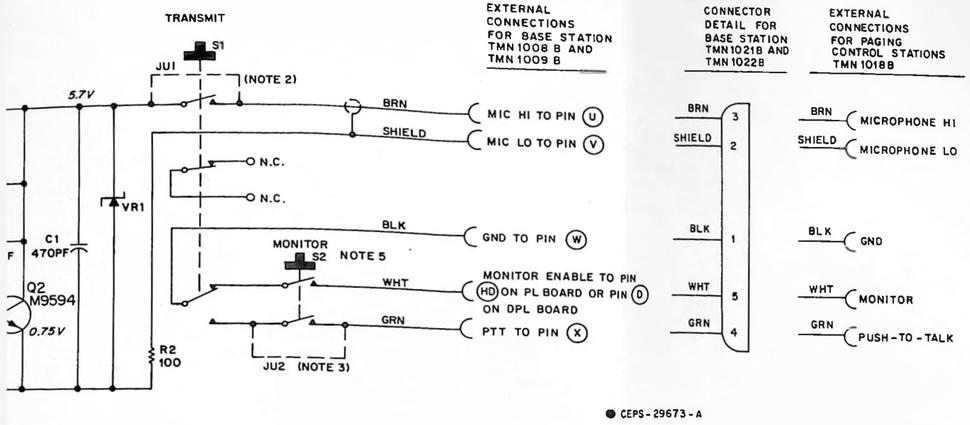
2/1/81-PHI



● CEPS-29673-A

ICROPHONE MODEL COMPLEMENT

8B	TMN1009B	TMN1018B	TMN1021B	TMN1022B	DESCRIPTION
	X	X	X	X	TRN4315A MICROPHONE CIRCUIT BOARD
		X		X	THN6404A MICROPHONE HOUSING AND HARDWARE KIT (PL AND DPL)
	X		X		THN6388A MICROPHONE HOUSING AND HARDWARE KIT (CARRIER SQUELCH)
	X				TKN8093A CABLE KIT
		X			TKN8094A CABLE KIT
			X	X	TKN8095A CABLE KIT

parts list

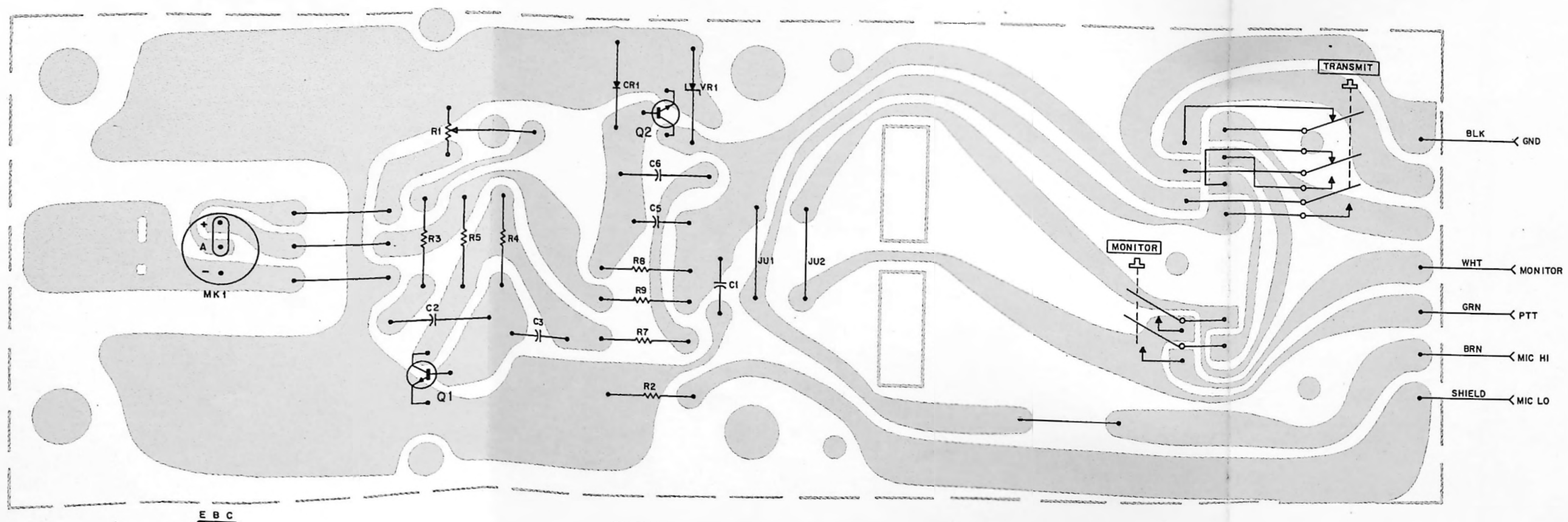
THN6388A Housing & Hardware Kit ("Carrier Squelch")
THN6404A Housing & Hardware Kit ("Private-Line") PL-6862-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch, microphone:
S1	40-84711E02	leaf (THN6388A)
S1	40-84711E03	leaf (THN6404A)
		non-referenced items
	2-10101A69	NUT, spring: 2 used
	3-135676	SCREW, switch mtg.: 4-40 x 1/4"; 3 used
	3-138809	SCREW, baseplate: 4-40 x 5/16"; 4 used
	3-140047	SCREW, front cover: 4-20 x 5/8"; 4 used
	4-10058B10	WASHER, felt (THN6404A)
	15-82976M01	COVER, front
	15-82978M01	COVER, rear
	15-84191E01	HOUSING, microphone
	22-82591C05	PIN, roll (THN6388A)
	38-84184E02	BUTTON, blank (THN6388A)
	38-84184E01	BUTTON, "MONITOR" (THN6404A)
	38-84192E01	BUTTON, "TRANSMIT"
	42-82143C05	CLAMP, cable
	42-84725E01	CLIP, shaft retainer
	47-84193E01	SHAFT, button mtg. pivot
	47-84194E01	SHAFT, extension
	47-84723E01	SHAFT, coupling (THN6388A)
	64-82977M01	PLATE, base
	75-84722E01	PAD, base plate

TRN4315A Microphone Circuit Board PL-6863-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ±10%; 500 V: unless otherwise stated
C1	21-82187B45	470 pF
C2	8-82096J08	.022; 250 V
C3	21-82187B44	.001; 100 V
C4	23-84665F09	15 +150 -10%; 25 V
C5	21-82187B06	560 pF
C6	8-82096J04	.047; 250 V
		diode: (see note)
CR1	48-83654H01	silicon
		cartridge, microphone:
MK1	50-82825M01	electret
		transistor: (see note)
Q1, 2	48-869594	NPN; type M9594
		resistor, fixed: ±5%; 1/4 W: unless otherwise stated
R1	18-84944C02	variable: 25k ±20%
R2	6-124C25	100 ±10%
R3	6-124C77	15k ±10%
R4	6-124B14	470k
R5	6-124A73	10k
R6		NOT USED
R7	6-124A59	2.7k
R8	6-124B08	270k
R9	6-124C55	1.8k ±10%
		diode: (see note)
VR1	48-82256C38	Zener; 9.1 V ±5%

note: For optimum performance diodes, transistors and integrated circuits must be ordered by Motorola part numbers.



E B C
TRANSISTOR BASE DETAIL

SHOWN FROM COMPONENT SIDE

SOLDER SIDE ● BD-DEPS-29674-A
OL-DEPS-29675-A

TKN8093A Cable Kit, "Maxar" Base Station PL-6864-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	30-83560A02	CABLE, 6-conductor; 60" long
	39-10184A24	CONTACT, receptacle: 5 used
	37-82633B13	GROMMET, rubber

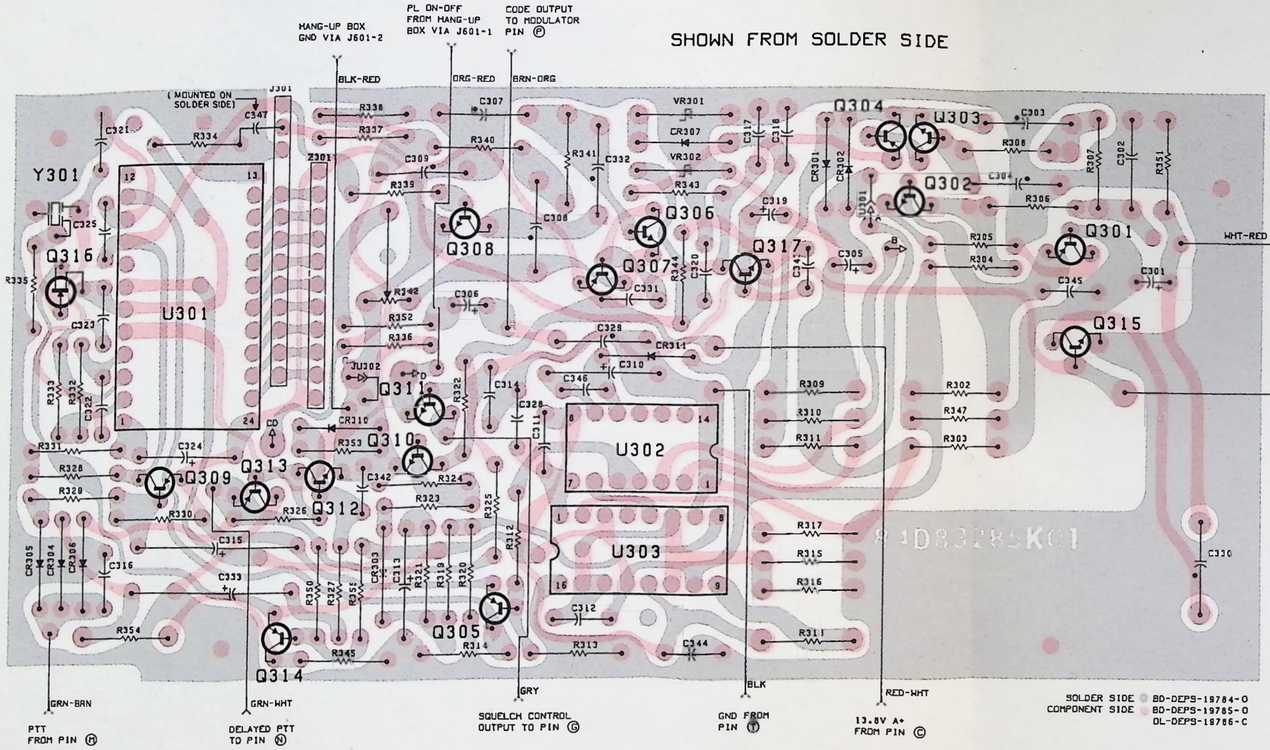
TKN8094A Cable Kit, "Maxar" Paging Base Station PL-6865-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	29-847854	LUG, slatted tongue: 5 used
	30-83560A02	CABLE, 6-conductor: 48" long
	37-82633B13	GROMMET, rubber

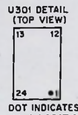
TKN8095A Cable Kit, "Maxar 80" Base Station PL-6866-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15-82062M01	HOUSING, cable
	28-82005M01	CONNECTOR, plug: 5-contact
	30-83560A02	CABLE, 6-conductor: 60" long
	37-82633E13	GROMMET, rubber
	42-82061M01	CLAMP, cable
	43-82063M01	COLLAR
	29-83277G01	LUG, cable: 5-used

SHOWN FROM SOLDER SIDE



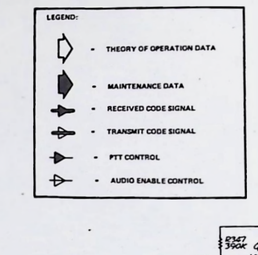
U301 DETAIL (TOP VIEW)



DOT INDICATES PIN 1 LOCATION

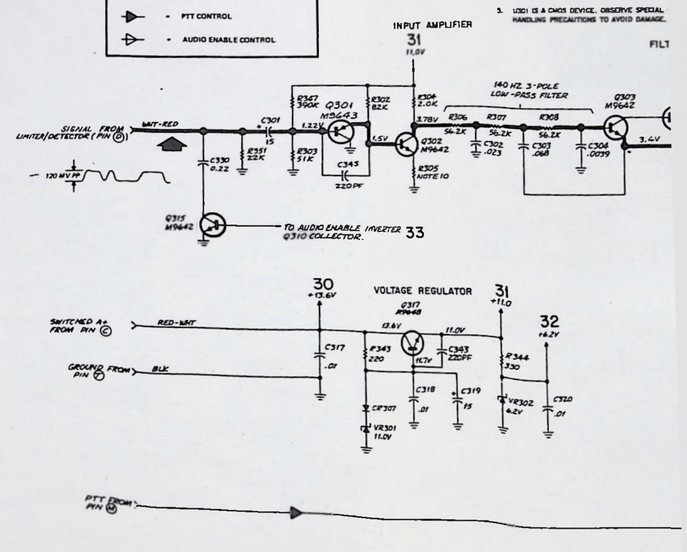
TRANSISTOR BASE DETAILS (LEAD SIDE)

SOLDER SIDE BD-DEPS-19784-O
COMPONENT SIDE BD-DEPS-19785-O
DL-DEPS-19786-C

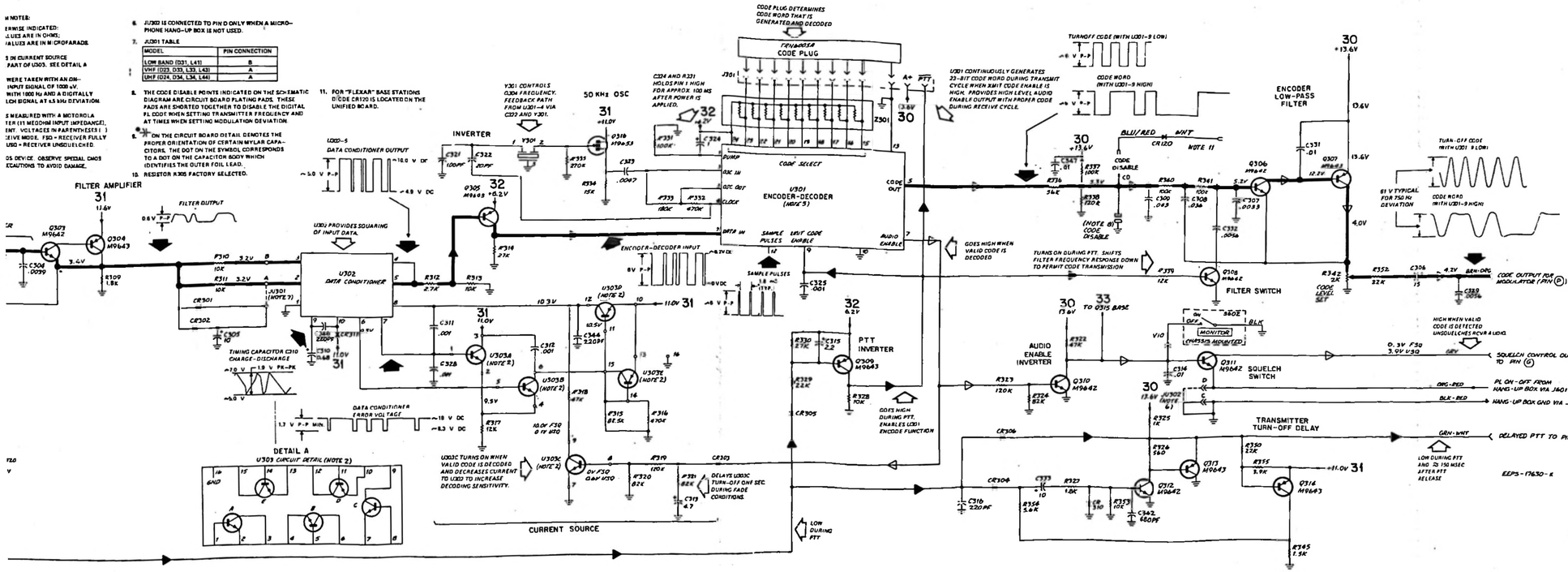


SCHEMATIC & DIAGRAM NOTES:

1. UNLESS OTHERWISE INDICATED: RESISTOR VALUES ARE IN OHMS. CAPACITOR VALUES ARE IN MICROFARADS.
2. TRANSISTORS IN CURRENT SOURCE CIRCUIT ARE PART OF U303. SEE DETAIL.
3. WAVEFORMS WERE TAKEN WITH AN ON-CHANNEL RF INPUT SIGNAL OF 1000 uV, MODULATED WITH 1000 Hz AND A DIGITAL CODED SQUELCH SIGNAL AT ±5 kHz DEVIA
4. DC VOLTAGES MEASURED WITH A MOTORC DC MULTIMETER (11 MEGOHM INPUT IMPEC OR EQUIVALENT. VOLTAGES IN PARENTHI ARE FOR RECEIVE MODE. FSO - RECEIVER SQUELCHED, USQ - RECEIVER UNSQUELCH
5. U301 IS A CMOS DEVICE. OBSERVE SPECIAL HANDLING PRECAUTIONS TO AVOID DAMAGE.



DIGITAL PRIVATE-LINE
ENCODER/DECODER
MODEL TRN6207A


CODE PLUG DETERMINES CODE WORD THAT IS GENERATED AND DECODED
TRN6005A CODE PLUG
U301 CONTINUOUSLY GENERATES 23-BIT CODE WORD DURING TRANSMIT CYCLE WHEN XMIT CODE ENABLE IS HIGH. PROVIDES HIGH LEVEL AUDIO ENABLE OUTPUT WITH PROPER CODE DURING RECEIVE CYCLE.
TURNOFF CODE (WITH U201-9 LOW)
CODE WORD (WITH U201-9 HIGH)
ENCODER LOW-PASS FILTER
INVERTER
Y301 CONTROLS CLOCK FREQUENCY. FEEDBACK PATH FROM U301-4 VIA C322 AND Y301.
50 KHz OSC
C324 AND R331 HOLD PIN 1 HIGH FOR APPROX. 100 MS AFTER POWER IS APPLIED.
U301 ENCODER-DECODER (MOS/LSI)
CODE SELECT
CODE OUT
AUDIO ENABLE
SAMPLE PULSES
UNIT CODE ENABLE
ENCODER-DECODER INPUT
DATA IN
CODE DISABLE
BLU/RED
WHT
CR1120
NOTE 11
(NOTE 8) CODE DISABLE
FILTER SWITCH
TURN-OFF CODE (WITH U201-9 LOW)
61 V TYPICAL FOR 750 Hz DEVIATION
CODE WORD (WITH U201-9 HIGH)
CODE OUTPUT FOR MODULATOR (PIN P)
FILTER AMPLIFIER
FILTER OUTPUT
U302 PROVIDES SQUARING OF INPUT DATA.
U302 DATA CONDITIONER
TIMING CAPACITOR C310 CHARGE-DISCHARGE
DATA CONDITIONER ERROR VOLTAGE
DETAIL A
U303 CIRCUIT DETAIL (NOTE 2)
CURRENT SOURCE
U303C TURNS ON WHEN VALID CODE IS DECODED AND DECREASES CURRENT TO U302 TO INCREASE DECODING SENSITIVITY.
DELAYS U303C TURN-OFF ONE SEC. DURING FADE CONDITIONS.
PTT INVERTER
GOES HIGH DURING PTT. ENABLES U301 ENCODE FUNCTION
GOES HIGH WHEN VALID CODE IS DECODED
TURNS ON DURING PTT. SHIFTS FILTER FREQUENCY RESPONSE DOWN TO PERMIT CODE TRANSMISSION
AUDIO ENABLE INVERTER
SQUELCH SWITCH
HIGH WHEN VALID CODE IS DETECTED UNSQUELCHES RCVR AUDIO.
SQUELCH CONTROL OUTPUT TO PIN G
ORG-RED
PL ON-OFF FROM HANG-UP BOX VIA J601-1
BLK-RED
HANG-UP BOX GND VIA J601-2
TRANSMITTER TURN-OFF DELAY
GRN-WHT
DELAYED PTT TO PIN N
LOW DURING PTT AND IS 150 MSEC AFTER PTT RELEASE
CODE OUTPUT FOR MODULATOR (PIN P)
BRN-ORG
EEPS-17630-K
TO 0315 BASE
MONITOR
DEFEATED
LOW DURING PTT

FUNCTION

Encodes and decodes *Digital Private-Line* codes. Encoder modulates transmitter and delays transmitter turn-off 150 ms to allow transmission of turn-off code. Decoder detects received tone and unsquelches receiver when proper code is received.

PARTS LIST SHOWN ON BACK

68P81030E07-L
(Sheet 1 of 2)
2/1/81-PHI

DIGITAL PRIVATE-LINE **ENCODER-DECODER**

parts list

TRN6207A "Digital Private-Line" Encoder-Decoder — PL-3560-F

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 5%; 50 V unless otherwise stated
C301, 306, 319	23-84665F02	15 + 100-0%; 35 V
C302	8-82905G39	.023
C303	8-83813H23	.068
C304	8-83813H19	.0039
C305	23-84665F01	10 + 100-0%; 35 V
C307	8-83813H27	.0033
C308	8-83813H24	.036
C309	8-83813H14	.043
C310	23-82783B48	0.68; 35 V
C311, 312, 328	21-82187B44	.001 ± 10%; 100 V
C313	23-84762H07	4.7 ± 20%; 10 V
C314, 317, 318, 320, 331	21-82428B04	.01 + 70-30%; 200 V
C315	23-82783B16	2.2 ± 10%; 25 V
C316, 344, 345	21-83596E10	220 pF ± 10%; 500 V
C321	21-83798B01	100 pF; 200 V
C322	21-840849	20 pF; 500 V
C323	21-82428B09	.0047 ± 10%; 100 V
C324	23-82783B08	1 ± 20%; 35 V
C325	21-82187B44	.001 ± 10%; 100 V
C329, 332	8-83813H26	.0056
C330	8-82905G32	0.22 ± 10%
C333	23-82783B27	10
C342	21-83596E17	680 pF ± 10%; 500 V
C343, 346	21-82877B24	220 pF
C347	21-82213E12	.01 ± 20%; 100 V
		diode: (see note 1)
CR301, 302	48-84616A01	hot carrier
CR303, 304, 305, 307, 310, 311	48-83654H01	silicon
CR306	48-82178A06	germanium
		socket:
J301	9-82071K01	female; 12 contact
		transistor: (see note 1)
Q301, 304, 305, 307, 309, 313, 314	48-869643	PNP; type M9643
Q302, 303, 306, 308, 310, 311, 312, 315	48-869642	NPN; type M9642
Q316	48-869653	field-effect; type M9653
Q317	48-869648	NPN; type M9648
		resistor, fixed: ± 5%; 1/4 W; unless otherwise stated
R302	6-124A95	82k
R303, 336	6-124A90	51k
R304, 327	6-124A56	2.0k
R305		(factory selected)
R306, 307, 308	6-13755D64	56.2k ± 1%
R309	6-124A55	1.8k
R310, 311	6-124A73	10k
R312	6-124C59	2.7k ± 10%
R313, 328, 353	6-124C73	10k ± 10%
R314	6-124C83	27k ± 10%
R315	6-13755D80	82.5k
R316, 332	6-124B14	470k
R317, 339	6-124A75	12k
R318	6-124A89	47k
R319, 323, 338	6-124A99	120k
R320, 321, 324	6-124C95	82k ± 10%
R322	6-124C89	47k ± 10%
R325	6-124C49	1k ± 10%
R326	6-124C43	560 ± 10%
R329	6-124A81	22k
R330	6-124A83	27k
R331	6-124C97	100k ± 10%
R333	6-124B04	180k
R334	6-124A77	15k
R335	6-11009D08	270k
R336	6-124A91	56k
R337, 340, 341	6-124A97	100k
R342	18-84944C01	var; 2k
R343	6-124C33	220 ± 10%
R344	6-124C37	330 ± 10%
R345	6-124A53	1.5k
R347	6-124B12	390k
R350, 351, 352	6-124C81	22k ± 10%
R354	6-124A67	5.6k
R355	6-124A63	3.9k
		integrated circuit: (see note 1)
U301	51-80074C01	type 74C01
U302	51-83629M01	type 29M01
U303	51-83629M10	type 29M10
		network:
Z301	51-82142K02	resistive
Y301	48-82003K01	**crystal: (see note 2)** resonator; 50.00000 kHz
		voltage regulator:
VR301	48-82256C34	Zener type; 11.0 V
VR302	48-83696E07	Zener type; 6.2 V

notes:

1. Replacement transistors must be ordered by Motorola part number only for optimum performance.
2. When ordering crystal units, specify carrier frequency, crystal frequency and crystal type number.

MOTOROLA

AVAILABLE BACKGROUND REFERENCE PUBLICATIONS

Five reference publications are available to provide background information needed to service some of the newer Motorola products more effectively. The information in these publications is not duplicated in our instruction manuals. To obtain your free copy, check the ones you want and return this self-mailer to us. (NOTE: One copy of each publication has already been distributed to Motorola Service Shops (MSS's) and field technical representatives (FTR's).

Check item desired:

☐ **Basic Logic Circuit Guide** — 68P81105E88
Describes the basic logic circuits used in Motorola Communications digital equipment and the logic notational scheme used in our instruction manuals.

☐ **"Digital Private-Line" Binary-Coded Squelch** — 68P81106E83
Contains fundamentals of "Digital Private-Line" system operation, circuit operation and servicing techniques.

☐ **Safe Handling of CMOS Integrated Circuit Devices** — 68P81106E84
Describes special handling techniques needed to prevent irrepairable damage from static charges encountered with normal handling of CMOS devices.

☐ **Reducing Noise Interference in Mobile Two-Way Radio Installations** — 68P81109E33
Defines the major sources of noise encountered in a mobile radio installation and suggests methods of remedying them.

☐ **Anti-Skid Braking Precautions** — 68P81109E34
Provides installation suggestions and a detailed checkout procedure for installation of mobile radios in vehicles with anti-skid braking systems.

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